

**STORMWATER SOURCE CONTROL
ROUND 4 SAMPLING REPORT
2009-2010**

FOR BOEING PLANT 2

**Boeing Plant 2
Seattle/Tukwila, Washington**

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1.0 INTRODUCTION

This report has been prepared on behalf of The Boeing Company (Boeing) as part of Duwamish Waterway sediment source control activities at the 107-acre Plant 2 facility (Figure 1). Plant 2 is located on East Marginal Way South in Seattle, Washington, with the southern portion extending into Tukwila, Washington. This report addresses sampling completed under the Revised Stormwater Source Control Work Plan (revised work plan) for Boeing Plant 2 (Golder and Floyd|Snider 2007). The revised work plan was prepared and has been carried out in response to the Environmental Protection Agency's (EPA) May 26, 2006 request for an interim measure (IM), and in accordance with the 1994 Administrative Order on Consent (Order) No. 1092-01-22-3008(h) between Boeing and EPA Region X. The Order is issued pursuant to Section 3008(h) of the Solid Waste Disposal Act, also referred to as the Resource Conservation and Recovery Act (RCRA).

The west side of Plant 2 adjoins a section of the Lower Duwamish Waterway. Duwamish Waterway sediment in front of Plant 2 is being addressed as part of the Order, and is referred to as the Duwamish Sediment Other Area (DSOA). Cleanup of DSOA sediments will be performed under RCRA as an IM in a manner consistent with the corrective measure process under the Order.

As part of the sediment cleanup action, and within the context of a Duwamish-wide initiative, potential sources of contamination must be identified and demonstrated to be controlled. To this end, the objectives of stormwater source control are to 1) investigate and document the extent to which contaminants may be discharged from the Plant 2 storm system to the Duwamish Waterway via either water or suspended solids, and 2) initiate control actions necessary following the identification of any such contaminants and their source(s). The annual source control investigation consists of sampling of both stormwater and suspended solids in the stormwater from selected locations within the Plant 2 stormwater system, comparing analytical data to action levels, and identifying areas and methods for control actions, as necessary.

Boeing submitted the original Stormwater Source Control Work Plan (original work plan) (Golder and Floyd|Snider 2006) to EPA on October 4, 2006 based on EPA's August 31, 2006 approval with modifications of the draft work plan. The first round (round 1) of source control sampling was conducted between October, 2006 and April, 2007. The round 1 results were presented in the Stormwater Source Control Round 1 Sampling Report (round 1 sampling report) (Golder 2007). Following completion of round 1, Boeing submitted the revised work plan, which was approved by EPA on January 15, 2008. Results of the second and third rounds (rounds 2 and 3) of source control sampling were presented in their respective sampling reports (Golder 2008a; 2010a).

The fourth round (round 4) of source control sampling began on November 9, 2009 and was completed on April 22, 2010. This report documents the round 4 sampling effort, presents the analytical results, and identifies response actions where necessary. Section 2 summarizes the overall source control investigation approach. Section 3 presents the field and analytical methodology for round 3 sampling. Section 4 summarizes the round 3 analytical results. Section 5 presents conclusions and identifies source control actions.

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2.0 SUMMARY OF SOURCE CONTROL EVALUATION

The annual stormwater source control investigation was initiated in 2006 in response to elevated concentrations of polychlorinated biphenyls (PCBs) and metals detected in catch basin solids samples during a 2005 storm system survey (Tier 1/Tier 2 survey) (Floyd|Snider 2005). Source control sampling is now conducted annually during the rainy season (October to May). Rounds 1 (2006-2007), 2 (2007-2008), and 3 (2008-2009) have been completed and reported to EPA (Golder 2007, 2008a; 2010a). Round 4 (2009-2010) began on November 9, 2008 and was completed on April 22, 2010.

The Plant 2 stormwater source control evaluation described in the original work plan consisted of sampling and analysis of suspended solids and/or water along 12 of the 24 active stormwater lines. EPA selected the stormwater lines to be sampled in a letter dated May 26, 2006 following discussions and a tour of the Plant 2 stormwater system. For some lines, both a suspended solids sample and a water sample were to be collected. For lines where building roofs are the sole source of drainage, only water samples were to be collected.

Selected stormwater lines that convey primarily roof drainage (D, G, L, M, O, S, and V) were selected to undergo one-time water-only sampling. Stormwater lines A, B, I, J, and Z had detectable concentrations of PCBs and/or metals within catch basin solids samples collected during the Tier 1/Tier 2 survey (Floyd|Snider 2005). Locations along these five lines were identified for either contingent one-time (line A) or periodic (lines B, I, J, and Z) sampling for both suspended solids (using a filtration device) and water (passing through the filtration device). Along line J, two sampling locations were selected due to the line's split piping configuration before it discharges to the municipal roadway drainage system along 16th Avenue. During round 1, the line A sampling location was re-located from the outfall (2-449), identified in the original work plan, to an upgradient location (2-371) due to continuous tidal interference. This modification was documented in the revised work plan. The original work plan also identified action levels to which the data would be compared to assess the need for further source control measures.

Based on comparison of round 1 results to action levels, the round 1 sampling report identified sampling locations, media, and associated analyses for subsequent source control sampling, beginning with the 2007-2008 rainy season. During round 1, source control analytes were detected above action levels in samples from only two of the seven locations selected for one-time water-only sampling (lines G and V). As a result, during round 2, water-only samples were collected from only these two locations. Both suspended solids and water sampling were continued at all six of the round 1 sampling locations. As identified in the revised work plan, the planned analyses were also updated based on results from the first sampling round.

The round 2 results affirmed some round 1 exceedances of source control action levels for both PCBs and metals. To address these exceedances, in March 2008, Boeing submitted an IM work plan that identified source control actions (2008 IM) to be completed during the summer of 2008 (Golder 2008b). The IM work plan was submitted in May 2008 (approved by EPA in June) prior to submission of the round 2 data report (Golder 2008a) to allow implementation of the control actions during the dry summer months. The IM was conducted during the summer and fall of 2008, and is described in the Interim Measure Completion Report - 2008 Stormwater Source Control Catch Basin Sampling and Storm Line Cleaning for Boeing Plant 2 (IM Completion Report) (Golder 2008c). In general, the 2008 IM consisted of:

- Visually inspecting catch basins and collecting solids samples to assess potential entry points for PCBs and metals
- Cleaning catch basins and structures based on the analytical results and visual observations of accumulated solids
- Cleaning stormwater lines to remove legacy solids that may be ongoing sources of PCBs and metals detected during source control sampling
- Conducting a video survey of the stormwater lines to assess the integrity of the pipes and evaluate the cleaning
- Installing geotextile filter fabric inserts at selected stormwater system entry points to reduce the volume of solids entering the stormwater system

As part of this IM:

- 494 samples were collected from 364 locations
- 27,034 linear feet of stormwater line were cleaned, including 349 storm line segments and 12 channel drains/trench drains
- 417 structures were cleaned, including catch basins, inlets, manholes, pump basins, channel drain collection boxes, and oil/water separators
- 18,435 linear feet of stormwater line were inspected via video survey
- 261 new geotextile filter fabric inserts were installed at grated structures such as catch basins and inlets, and 26 existing fabric inserts were removed, cleaned, and re-installed at the remaining catch basins and inlets

Round 3 results demonstrated a general improvement from rounds 1 and 2, but indicated that PCBs and metals remained variably present in stormwater discharges at concentrations above their respective action levels (Golder 2010a). To address the remaining exceedances, during the fall of 2009, Boeing sampled and cleaned or replaced geotextile surface inserts in catch basins on storm lines B, I, J, and Z. Boeing also thoroughly swept the area around the Jet A fuel tanks near the east end of storm line B where elevated PCB concentrations had previously been detected in the stormwater system. This work was documented in a technical memorandum (2010 tech memo) submitted to EPA on April 13, 2010 (Golder 2010b).

The 2009-2010 round 4 source control investigation data presented in this report is evaluated relative to results from rounds 1 through 3 to gauge the effectiveness of source control actions to date, and determine whether additional mitigation actions are warranted.

3.0 2009-2010 SOURCE CONTROL SAMPLING

The 2009-2010 Plant 2 stormwater source control evaluation consisted of sampling and analysis of suspended solids and/or water along seven of the 24 active stormwater lines. Two lines that convey primarily roof drainage (G and V) were sampled for water only. The remaining five lines (A, B, I, J, and Z) were sampled for both suspended solids and water.

Table 1 lists the sampling locations by stormwater line. For each sampling location, the table provides the media, sampling frequency, and laboratory analyses performed. Figures 2a and 2b present the 2009-2010 source control sampling locations. Samples were collected in accordance with the sampling and analysis plan (SAP) provided as Attachment A of the revised work plan. The following sections describe source control sample collection and, where applicable, deviations from the procedures described in the revised work plan.

3.1 Suspended Solids and Associated Water Samples

The revised work plan identified six locations along five stormwater lines (A, B, I, J, and Z) for sampling of both suspended solids and water (Table 1). Two sampling locations were selected along line J due to the line's split piping configuration before it discharges to the municipal roadway drainage system along 16th Avenue.

A pump and filtration method is used to obtain suspended solids and associated water samples. At each location, an electric sump pump is lowered to the bottom of the vault. The pump is controlled by a float switch calibrated to activate at approximately eight inches of submergence, and to deactivate at a lower water level just above the pump intake. The pump is fastened to a length of PVC pipe, which is connected at ground surface to a 20-inch stainless steel filter housing containing a 5 micron polypropylene felt filter bag. A pressure gauge is mounted on the filter housing. A water sampling port and a flow totalizer are placed downstream of the filter bag. Discharge is routed via garden hose to either the downstream pipe exiting the manhole or to a downstream catch basin. A rain gauge is placed on the ground surface near the sampling apparatus to measure cumulative rainfall over the sampling period.

Pumping and filtration at the six locations was conducted between November 13, 2009 and April 22, 2010 using three identically-constructed sampling devices. A water sample was collected as soon as practicable following setup of each sampler. Water samples for metals analysis were filtered using a 0.45 µm field filter.

At each location, the sampler was deployed for several weeks to several months, depending on weather conditions, the construction of the basin, and other logistical considerations. After filtering several thousand gallons, the filter bag was removed from its housing and inspected for solids accumulation. If the solids material present appeared sufficient for the required laboratory analyses, sampling was completed, and the filter bag was packaged for transport the laboratory. Otherwise, the filter bag was returned to the housing for additional filtration.

Table 2 presents the sampling duration, cumulative rainfall, volume of stormwater filtered, and the suspended solids mass recovery at each of the six sampling locations. Field sample collection forms for suspended solids and associated water samples are provided in Attachment A. Locations 2-371 (line A) and 36-131 (line Z) are periodically tidally influenced; the bottom elevation of each is generally below the high tide level, but above the low tide level.

For these locations, the pump is connected to a timer programmed to switch on during low tide periods only. Therefore, pumping and filtration at these locations is limited to rain events occurring while the tide elevation is below the vault bottom.

Water and filter bag samples are submitted to Analytical Resources, Inc. (ARI), of Tukwila, Washington, for analysis of metals, dissolved metals, and/or PCBs, as indicated in Table 1. Both metals and dissolved metals analyses comprised arsenic, cadmium, chromium, copper, lead, mercury, silver, and zinc, the eight constituents for which State of Washington Sediment Management Standards (Chapter 173-204 WAC) have been developed. As specified in the revised work plan, the lab was instructed to conduct metals analysis on only those filter bag samples where sufficient solids mass was recovered to remove a representative sample for analysis independent of the filter bag matrix. During round 4, each filter bag sample submitted contained sufficient solids for metals analysis. For filter bag samples from lines B, I, J, and Z, following removal of the metals sample, the entire bag was extracted for PCB analysis. As identified in the revised work plan, the sample from location line A requires analysis of metals only (PCBs were detected below the source control action level in the round 1 sample).

During round 4, several circumstances encountered in the field required adaptation of the suspended solids sampling procedure, modification of the sampling locations, and/or repetition of sampling attempts. Although not considered deviations from the work plan, these circumstances were communicated to EPA via email on March 15 and 16. The following paragraphs summarize the equipment modifications made during round 4.

As noted in the revised work plan and the round 1 report, manhole 18-505A (line J) is a wide, flat, flow-through vault that must be dammed for the water level to rise sufficiently to trigger the float switch on the sampling pump and initiate filtration. During round 1, when the sampling method was still under development, a filtered solids sample was not recovered from this location. The sample was successfully collected during subsequent rounds by damming the vault, typically with sand bags filled with sand and/or a plywood board placed over the outflow pipe. In some cases, including round 4, bentonite chips were placed in one or more of the sandbags.

On February 19, during a routine check of the sampler at this location, the field crew found a grey film coating the filter bag. Inspection of the basin revealed nothing unusual and no indication of the source of the residue. The water flowing through the pipe appeared clear and there was no such material on any of the concrete or sandbag surfaces. After some additional observations and internal discussion, it was determined that the film was likely hydrated bentonite that had leaked from the sandbags damming the vault. The field crew did not observe any free bentonite within the basin, and there was no evidence of bentonite material observed in the water sample collected on February 3. The tainted filter bag was collected on March 9 along with a sample of unhydrated bentonite. Both samples were submitted to ARI for analysis of PCBs and metals. All bentonite and sand-filled bags were removed from the vault and the sampler was temporarily decommissioned. On March 22, a contractor performed confined space entry to install a semi-permanent brick and mortar dam at 18-505A.

At the time the dam was installed at 18-505A, sampling had been underway at manhole 3-307 (line B), another relatively flat, flow-through style vault, for over a month. Despite efforts to block the outflow pipe with a wooden board and sandbags, the water level had not risen sufficiently to trigger the pump, except on one occasion when it was manually activated by the

field crew during a rain event. Therefore, to facilitate sample collection and eliminate the need for sandbags, a semi-permanent dam consisting of a wooden board, bricks, and mortar, was installed at 3-307 on March 22, mid-way through the sampling period for this location. The sampler was unplugged and removed from the vault during installation of the dam and was re-activated three days later, following inspection of the vault to confirm that the mortar had set.

Similarly, after confirming that the mortar had set at 18-505A, on March 29 the field crew decontaminated the bentonite-tainted sampler and re-installed it with a new filter bag. On April 2, the flow totalizer was found malfunctioning (i.e., the meter dial remained stationary as water emerged from the discharge hose). Upon visual inspection, the filter bag appeared clogged. The sample was submitted to ARI on hold (due to the lack of flow information), the flow totalizer was replaced, and a third sampling attempt was initiated. The third filter bag was submitted to ARI on April 22 for analysis of PCBs and metals, and analysis of the second bag was canceled. As a result, as presented in Tables 3 and 4, there are two sets of filtered solids results for this location, one for the bentonite-tainted sample and a second for the re-sample completed on April 22.

In addition, approximately two weeks after initiation of sampling at manhole 2-371 (line A), one of the two tidally-influenced locations that are sampled using a timer, the field crew discovered an unexpectedly large volume of water (approximately 20,000 gallons) had passed through the system. Upon inspection of the sampling train, the pump was found lying on its side at the vault bottom with the float switch submerged. As a result, the field crew suspected that a considerable amount of tide water, in addition to storm water, had been pumped through the filter bag. The pump was re-set and secured to prevent it from moving. The filter bag was replaced and sampling was re-initiated. Due to the tidal interference, the original filter bag was not submitted for analysis.

3.2 Water-Only Samples

As indicated in Tables 1 and 2, water-only samples were collected from one outfall (line G) and one upgradient catch basin (along line V, where the outfall is inaccessible). Water-only samples were collected on November 9, 2009. Field sample collection forms for water-only samples are provided in Attachment A.

Outfall G is easily accessible and can be sampled by holding bottles directly in front of the pipe opening. The 2-44 gate valve manhole is sampled from ground surface using a peristaltic pump and dedicated tubing. A field duplicate sample was collected at this location. Both the sample and its duplicate were filtered using a 0.45 μm field filter. Water samples were submitted to ARI for analysis of SVOCs and dissolved metals, as identified in Table 1.

3.3 Decontamination and Field Quality Assurance

The pump and filtration apparatus used to collect the suspended solids and associated water samples was decontaminated between sampling locations. After each sampling event, the system was flushed with approximately 30 gallons of an Alconox-tap water solution, and then rinsed with 15 to 20 gallons of tap water followed by 35 gallons of deionized water (supplied by ARI). Following decontamination, an equipment blank sample was collected from the deionized water pumped through the sampling train. Equipment blanks were analyzed for PCBs and dissolved metals. Equipment blank results are provided in Attachment B.

Sampling material associated with the water-only samples was dedicated, single-use equipment and did not require decontamination.

4.0 2009-2010 SOURCE CONTROL SAMPLING RESULTS

Samples were analyzed by ARI in accordance with the SAP provided as Attachment A of the revised work plan. The following sections describe the analytical methodology and summarize the analytical results. Analytical results are presented in Tables 3 through 5. Laboratory summary data packages are provided in Attachment B. Table B-1 lists the source control samples by stormwater line, media, and laboratory data package. Data validation results are provided in Attachment C.

4.1 Analytical Methodology and Data Conversion

The revised work plan specified that for round 2 and subsequent rounds, metals analysis is to be conducted on only those filter bag samples containing sufficient solids mass to remove a representative sample from the filter bag for analysis. This method eliminates the potential for metals contamination that was identified during round 1 based on detections of zinc in samples of unused filter fabric. The minimum amount of material that can be digested and analyzed for metals is limited by the analytical method to approximately 1 gram. For solids samples analyzed for both metals and PCBs, after the metals sample is removed the filter bag is dried, weighed, and extracted for PCB analysis.

Metals results are reported as a concentration in mg/kg-dry solids. PCB results are reported as total μg per sample. For comparison to source control action levels, the PCB result reported by the laboratory is adjusted to an estimated concentration in terms of analyte mass per dry solids weight. To facilitate this conversion, filter bags were pre-weighed by ARI. Analytical results are converted to $\mu\text{g/kg}$ -dry solids based on the difference between the initial and final dry weight of the filter bag. Filter bag initial and final weights and the data conversion equation are presented in Table 3.

4.2 Analytical Results for Suspended Solids and Associated Water Samples

Table 4 presents analytical results for suspended solids samples from rounds 1 through 4. Table 4 presents the PCB data converted to estimated concentrations in $\mu\text{g/kg}$ -dry solids, as described in Section 4.1.

PCBs were detected in all six round 4 suspended solids samples in which they were analyzed, with estimated concentrations exceeding the source control action level (1,000 $\mu\text{g/kg}$ -solids) in five of the six samples. Estimated concentrations above the action level ranged from 1,284 to 3,831 $\mu\text{g/kg}$.

During round 4, six metals (cadmium, chromium, copper, lead, mercury, and zinc) were detected above action levels in suspended solids samples. The sample from location 18-249 on line J had the most metals exceedances during round 4, with five metals (cadmium, copper, lead, mercury, zinc) detected above action levels.

Table 5 presents analytical results from rounds 1 through 4 for detected constituents in water samples from suspended solids and water sampling locations. (Constituents, such as dissolved mercury, that were detected below action levels during round 1 and not detected in rounds 2 and 3 are not included in Table 5.) Dissolved arsenic, copper, and zinc were detected in round 4 water samples. Dissolved copper exceeded the action level in the water samples from both

line J locations (18-249 and 18-505A). Dissolved zinc exceeded the action level in the line B water sample. There were no action level exceedances among the round 4 water sample results for lines A or Z. (As described in Section 5 and the round 3 report [Golder 2010a], water sampling at line I has been discontinued based on the first three rounds of results.)

4.3 Analytical Results for Water-Only Samples

Table 5 presents analytical results for detected constituents in water samples from water-only sampling locations (lines G and V) for rounds 1 through 4. The water sample from outfall G was analyzed for SVOCs; all analytes were reported as non-detect in the round 4 sample. The water sample and duplicate from line V were analyzed for dissolved metals only. Dissolved copper was not detected in the primary sample and was detected below the source control action level (3.1 µg/L) in the duplicate (2 µg/L). Dissolved zinc was detected below the action level (81 µg/L) in both the primary and duplicate samples at 40 µg/L (both samples). Arsenic was also detected below the action level in both samples.

5.0 CONCLUSIONS AND SOURCE CONTROL ACTIONS

In general, round 4 suspended solids data indicate that PCBs and metals remain variably present in Plant 2 stormwater solids in some lines at concentrations above their respective action levels. Round 4 dissolved copper and zinc results for source control water samples are generally consistent with the results of the quarterly stormwater quality sampling conducted under the Plant 2 National Pollutant Discharge Elimination System (NPDES) permit.

Ongoing source control sampling is discussed in Section 5.1. Section 5.1.1 identifies the criteria used annually, beginning with evaluation of the round 2 data, to identify the sampling matrix for the following round. Section 5.1.2 applies these criteria to round 4 results and presents the round 5 (2010-2011) sampling matrix. Section 5.2 evaluates round 4 results with respect to previous source control actions, and identifies additional upcoming source control actions. Section 5.3 presents the schedule for source control actions identified in Section 5.2, as well as for round 5 (2010-2011) source control sampling.

5.1 Ongoing Source Control Sampling

As described in Section 2, the Plant 2 stormwater source control evaluation specified in the original work plan consisted of sampling and analysis of suspended solids and/or water along 12 of the 24 active stormwater lines. Selected stormwater lines (D, G, L, M, O, S, and V) were identified for contingent one-time (based on comparison of results to action levels) water-only sampling. Stormwater lines A, B, I, J, and Z were identified for either contingent one-time (line A) or periodic (lines B, I, J, and Z) sampling for both suspended solids and water.

Based on round 1 results, line A (originally identified for one-time sampling) was designated for continued sampling of both suspended solids and water for metals analysis during round 2 and subsequent rounds. Among the seven locations originally selected for one-time water-only sampling, only two (lines G and V) were reported with source control analytes above action levels during round 1. As a result, during rounds 2 through 4, water-only samples were collected from only these two locations. Also during round 4, the four lines originally identified for periodic sampling of suspended solids and water (B, I, J, and Z) were re-sampled due to action level exceedances during rounds 1, 2, and 3.

The round 4 data is similarly evaluated to define the source control investigation for the following year. Section 5.1.1 identifies the criteria established in the round 2 report to identify sampling to be conducted during the next round. Section 5.1.2 evaluates the round 4 results based on these criteria and identifies the round 5 sampling matrix. Following its review of the round 3 report, EPA required that, beginning with round 5, Boeing add collection of whole water samples for PCB analysis to the source control sampling suite, as documented in its February 9, 2010 letter to Boeing (EPA 2010a). An addendum to the revised work plan is being prepared for introducing whole water sampling to the annual source control monitoring program. The round 5 sampling matrix therefore includes whole water sampling for PCB analysis at each location identified in the original work plan for sampling of PCBs in suspended solids (lines A, B, I, J, and Z).

5.1.1 Source Control Sampling Matrix Evaluation Criteria

As identified in the round 2 sampling report (Golder 2008a), the following criteria are applied annually at each remaining location to identify: 1) whether sampling will be continued during the next round, 2) media to be sampled, and 3) analyses to be performed.

- Location originally designated for one-time sampling of suspended solids and water (line A) – Given action level exceedances for metals, both media will continue to be sampled for metals until three consecutive rounds are completed without action level exceedances.
- Locations originally designated for periodic sampling of suspended solids and water (lines B, I, J, and Z) – Given action level exceedances for PCBs and metals, sampling will continue for both suspended solids (PCBs and metals) and water (dissolved metals) until three consecutive rounds are completed without action level exceedances.
- Locations originally designated for one-time water only sampling (lines G and V) – Sampling and analysis of the target analyte group (i.e., SVOCs and dissolved metals, respectively) will continue until three consecutive rounds of sampling are completed without action level exceedances.

Sampling beyond durations indicated here for source control purposes will be evaluated for long term source monitoring objectives following completion of the DSOA dredging project.

5.1.2 Summary of 2009-2010 Results and Proposed 2010-2011 Sampling

The fifth round of source control sampling will be conducted during the 2010-2011 rainy season. The source control sampling matrix for 2010-2011 is presented in Table 6. As indicated in the table, sampling of whole water for PCB analysis will be implemented at lines A, B, I, J, and Z during round 5, in accordance with EPA's February 2010 letter and the revised work plan addendum being prepared for submission during the summer of 2010. Figures 2a and 2b present the 2009-2010 sampling locations and Figures 3a and 3b present the 2010-2011 sampling locations.

As identified in Section 2, the original work plan prescribed one-time sampling for location 2-449 along line A. However, due to tidal interference, an alternate upgradient location (2-371) was sampled. During round 1, PCBs were detected below the action level in suspended solids from this location (Table 4), and were subsequently eliminated from consideration at line A. (A suspended solids sample from this location was inadvertently submitted for PCB analysis during round 3. PCBs were detected below the action level in this sample.) Metals, however, were detected above action levels in both the solids and water samples. Therefore, during rounds 2 through 4, both suspended solids and water from this location were sampled for metals. Cadmium and zinc concentrations in suspended solids exceeded action levels in rounds 1 and 3. During round 4, cadmium was detected slightly above the action level. In water samples, dissolved zinc was detected above the action level in rounds 1 through 3; however, during round 4, no dissolved metals were detected above action levels. Sampling of suspended solids and filtered water for metals analysis will be continued and sampling of whole water for PCB analysis will be added at this location during round 5.

At line B (3-307), originally designated for periodic sampling, total PCB concentrations in suspended solids samples exceeded the source control action level over the first three rounds, steadily decreasing from 2,407 to 1,137 µg/kg. Total PCBs were again detected above the action level, at 1,284 µg/kg, in the round 4 suspended solids sample. Cadmium, chromium, lead, and zinc were variably detected above action levels in suspended solids during the first three rounds; cadmium, chromium, mercury, and zinc exceeded action levels in suspended solids during round 4. Round 4 metals concentrations were generally consistent with the previous three rounds. Both dissolved copper and zinc were detected above action levels in rounds 1 and 2 water samples; only dissolved copper exceeded the action level during round 3, and only dissolved zinc exceeded the action level during round 4. Both suspended solids (metals and PCBs) and filtered water (dissolved metals), as well as whole water (PCBs) will be sampled at 3-307 during round 5.

At line I (4-283), originally designated for periodic sampling, total PCBs in the round 1 and 2 suspended solids samples exceeded the source control action level at 5,429 and 6,177 µg/kg, respectively. Total PCBs were detected above the action level in the round 3 sample collected following completion of the 2008 source control IM, but at a significantly lower estimated concentration, 1,447 µg/kg. PCBs were again detected above the action level during round 4, at an estimated concentration of 1,672 µg/kg. Metals data were not obtained for suspended solids during round 1 due to insufficient solids retention in the filter bag. During round 2, five metals were detected above action levels in suspended solids. During round 3, following completion of the 2008 source control IM, there were no metals exceedances in line I suspended solids. During round 4, chromium and zinc concentrations in suspended solids exceeded source control action levels. Metals concentrations in water samples from rounds 1 through 3 were below action levels; therefore, based on the criteria in Section 5.2.1, water sampling was discontinued at this location beginning with round 4. Suspended solids (metals and PCBs) will again be sampled at 4-283 during round 5; in addition, sampling of whole water for PCB analysis will be added to the sampling suite for this location.

At line J (18-249), originally designated for periodic sampling, total PCB concentrations in suspended solids samples from rounds 1 through 3 exceeded the source control action level, with sample concentrations ranging from 2,100 to 6,444 µg/kg. Total PCBs were again detected above the action level in the round 4 sample, at an estimated concentration of 3,831 µg/kg. Metals data were not obtained for suspended solids during round 1 due to insufficient solids retention in the filter bag. During rounds 2 and 3, cadmium, copper, mercury, and zinc were variably detected above action levels in suspended solids. Cadmium, copper, lead, mercury, and zinc were detected above action levels in round 4 suspended solids. Dissolved copper and zinc were detected above action levels in the water sample from round 2; only dissolved copper exceeded the action level in the rounds 3 and 4 water samples. Both suspended solids (metals and PCBs) and filtered water (dissolved metals), as well as whole water (PCBs), will be sampled at 18-249 during round 5.

Line J catch basin 18-505A was originally identified for periodic sampling. Sufficient suspended solids were not recovered from this location during round 1, but samples were successfully collected during rounds 2 through 4. PCBs were detected below the action level in the round 2 suspended solids sample and above the action level in the round 3 sample, at 658 and 1,090 µg/kg, respectively. During round 4, two filter bag samples were collected from 18-505A due to bentonite contamination in the first sample, as described in Section 3.1. Results for both samples are presented in Table 4. PCBs were detected above the action level in the first

(bentonite-tainted) sample, and well below the action level in the second sample. PCBs were not detected in the sample of unhydrated bentonite that was submitted along with the tainted filter bag sample, eliminating the bentonite as a possible source of the elevated PCBs (data are provided in Attachment B). The difference in PCB concentrations between the two samples may be due to the dam that was installed in the vault in between the two sampling attempts (Section 3.1). By creating a deeper reservoir, the dam enables the pump to engage during lower-intensity events, which may affect the nature of the solid particles that are suspended in the runoff. Copper and zinc were detected above action levels in rounds 2-4; copper was below the action level in the first round 4 sample, but above in the second. In general, metals results for the two round 4 filtered solids samples were comparable to one another. Dissolved copper and zinc were detected above action levels in rounds 1-3; only dissolved copper exceeded the action level in the round 4 water sample. Sampling of both suspended solids (metals and PCBs) and water (dissolved metals) will be continued at 18-505A during round 5; in addition, sampling of whole water for PCB analysis will be added to the sampling suite for this location.

At line Z (36-131), total PCBs in the round 1 and 2 suspended solids samples exceeded the source control action level. During round 3, following completion of the 2008 source control IM, total PCBs were detected below the action level. During round 4, total PCBs were again detected above the action level in suspended solids, at an estimated concentration of 3,133 µg/kg. Metals data were not obtained for suspended solids during round 1 due to insufficient solids retention in the filter bag. Chromium was detected above the action level in the round 2 suspended solids sample, and zinc was detected above the action level in the round 4 suspended solids sample. Dissolved copper was detected above the action level in the water sample from round 1; there were no action level exceedances in water samples from rounds 2 through 4; therefore, based on the criteria in Section 5.2.1, filtered water sampling for dissolved metals analysis will be discontinued at this location beginning with round 5. Suspended solids (metals and PCBs) will be sampled at 36-131 during round 5; in addition, sampling of whole water for PCB analysis will be added to the sampling suite for this location.

Outfall G was originally selected for one-time water-only sampling of SVOCs. However, chrysene was detected above the action level in the round 1 sample from outfall G; accordingly, this location was re-sampled for SVOCs during round 2 and subsequent rounds. Bis (2-ethylhexyl)phthalate was detected slightly above the action level during round 3. No SVOCs were detected during round 4. Outfall G will be re-sampled for SVOCs during round 5 based on the criteria identified in Section 5.2.1. Similarly, the 2-44 gate valve along line V was originally selected for one-time water-only sampling. Dissolved copper and zinc were detected above action levels during rounds 1 and 3; dissolved copper only was detected above the source control action level during round 2. There were no action level exceedances during round 4. Based on the criteria in Section 5.2.1, this location will be sampled for dissolved metals during round 5.

5.2 Additional Source Control Actions

In addition to documenting the fall 2009 sampling and cleaning activities, the 2010 tech memo (Golder 2010b) described upcoming measures planned to address ongoing PCB and metals sources in the Plant 2 stormwater system. These actions consist of sweeping, caulk removal, building materials assessment, and catch basin sampling/cleaning and filter fabric sampling/cleaning/replacement, as summarized in the following paragraphs.

A focused sweeping program will be implemented for concrete pavement surfaces identified in the 2010 tech memo as possible sources of PCBs. Sweeping will be conducted during the summer of 2010. Round 5 source control sampling results for both PCBs and metals will be used to gauge the effectiveness of sweeping.

The second phase of the caulk removal interim measure (IM), addressing lines I and J drainages in north Plant 2, is scheduled for the summer of 2010. The IM will include removal of approximately 1,545 linear feet of caulk materials (containing PCB concentrations greater than 25,000 µg/kg) from concrete pavements in three areas; two of the planned caulk removal areas are within the line I drainage, east of Building 2-15 and south of Building 2-10, and one of the removal areas is within the line J drainage, under the South Park Bridge. Caulking material in these areas may be an ongoing source of PCBs to lines I and J. More extensive source control action in this area will be planned in conjunction with King County's demolition and possible replacement of the South Park Bridge, which will affect lines I and J drainages. King County intends to remove portions of the existing bridge in 2010, and is currently soliciting funds for bridge replacement.

To further refine identification of upgradient sources, Boeing will conduct a building materials assessment and investigation of operational uses in each drainage area. Research will be conducted to identify building materials, and buildings and structures will be visually inspected in areas where elevated concentrations of PCBs and metals have been detected in catch basin and/or insert samples. Building exteriors will be examined for flaking, corrosion, or surfaces that, when exposed to rain, are potential sources of PCBs or metals in stormwater. Actions to identify, mitigate, or eliminate such surfaces may include sampling, coating, and/or replacement, as appropriate.

In continuation of the ongoing effort to control surface sources, during the dry season of 2010, all surface inserts on storm lines A, B, I, J, and Z will be cleaned or replaced, and catch basin bottoms will be assessed for rates of accumulation and cleaned as necessary. Samples will be collected from surface inserts and catch basin bottoms at selected locations in and around affected areas to further pinpoint remaining PCB sources. In addition, metals in catch basin solids have not been evaluated since completion of the 2008 IM. Therefore, during the summer of 2010, surface insert and bottom samples will be collected for metals analysis from selected representative catch basins and manholes along lines A, B, I, J, and Z, as described in the 2010 tech memo. Metals data will be compared to the 2008 IM catch basin solids and 2009 filter fabric sampling results, and iterative sampling will be conducted as necessary to further pinpoint metals sources to each storm line.

Finally, Boeing is planning a number of construction activities that will impact stormwater at Plant 2, including new stormwater systems as part of an extensive site redevelopment to take place south of the bridge over the next several years and upgraded stormwater systems in conjunction with a habitat project north of the bridge. Boeing will submit a work plan summarizing these activities, including proposed designs and timelines, and identifying the project(s) expected to upgrade stormwater system designs at each of storm lines A, B, I, J, V, and Z.

5.3 Scheduling

The source control actions identified in the 2010 tech memo and summarized in Section 5.2 will be conducted during the summer of 2010 (Golder 2010b). Boeing will submit a work plan describing stormwater system upgrades and associated monitoring protocols reflecting site redevelopment and related stormwater system replacement, by July 1, 2010, as specified in EPA's decision letter dated March 30, 2010 (EPA 2010b), issued in response to Boeing's March 15 Notice of Dispute on the Determination of Need for Additional Work to Control Storm Drain Discharges (Boeing 2010). The fifth round of source control sampling as defined in the 2010-2011 sampling matrix (Table 6) will begin in October 2010 and continue until sufficient sample material has been collected at all sampling locations or until the end of the rainy season (April to May, 2011).

6.0 REFERENCES

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- EPA (Albright, Richard) to Boeing (Mr. William Ernst). 2010b. EPA Decision, Determination of Need for Additional Work to Control Storm Drain Discharges, Boeing Plant 2, Tukwila, Washington, Resource Conservation and Recovery Act (RCRA) Docket No. 1092-01-22-3008(h) EPA ID No. WAD 00925 6819. March 30, 2010.
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- Golder Associates Inc. (Golder). 2007. Stormwater Source Control Round 1 Sampling Report. 2006-2007. Boeing Plant 2. October.
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- Golder. 2008b. Stormwater Source Control Interim Measure Work Plan for Boeing Plant 2. May 2008.
- Golder. 2008c. Interim Measure Completion Report 2008 Stormwater Source Control Catch Basin Sampling and Storm Line Cleaning for Boeing Plant 2. December 2008.
- Golder. 2010a. Stormwater Source Control Round 3 Sampling Report. 2008-2009. Boeing Plant 2. February.
- Golder. 2010b. Technical Memorandum: Fall 2009 Plant 2 Source Control Actions Completion Report. April 5.
- Golder and Floyd|Snider. 2006. Stormwater Source Control Work Plan for Boeing Plant 2. October.
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TABLES

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2009-2010 Sampling Matrix

Stormwater Source Control Round 4 Sampling Report
Boeing Plant 2

| Stormwater Line | Sampling Location | Suspended Solids Analyses Performed | Water Analyses Performed | Planned Sampling Frequency ¹ |
|-----------------|--------------------|-------------------------------------|-------------------------------------|---|
| A | 2-371 ² | SMS metals ³ | SMS metals (dissolved) ⁴ | one time |
| B | 3-307 | PCBs SMS metals | SMS metals (dissolved) | PCBs & metals periodically |
| G | discharge | NA | SVOCs | one time |
| I | 4-283 | PCBs SMS metals | NA | PCBs & metals periodically |
| J | 18-249, 18-505 | PCBs SMS metals | SMS metals (dissolved) | PCBs & metals periodically |
| V | 2-44 gate valve | NA | SMS metals (dissolved) | one time |
| Z | 36-131 | PCBs SMS metals | SMS metals (dissolved) | PCBs & metals periodically |

Notes:

1. "One time" denotes locations that were originally designated for contingent one-time sampling in 2006 where, based on round 1 results, sampling was continued during round 2.
 2. 2-449, the location immediately upgradient of the outfall was originally selected for sampling. Due to continuous tidal interference, 2-371 was selected as a replacement (Golder and Floyd|Snider, 2007).
 3. SMS metals comprise the eight metals (arsenic, cadmium, chromium, copper, lead, mercury, silver, zinc) for which State of Washington Sediment Management Standards (Chapter 173-204 WAC) have been adopted.
 4. Water samples for metals analysis are field-filtered using a 0.45 micron filter.
- NA - Not analyzed or not applicable

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TABLE 2

Rain Event and Stormwater Filtration Information

Stormwater Source Control Round 4 Sampling Report
Boeing Plant 2

| Stormwater Line | Sampling Point | Tidal Influence? | Sampling Device | Filtration Start Date | Filtration End Date | Stormwater Volume Filtered (gallons) | Total Solids Mass Captured in Filter (g dry weight) | Water Sampling Date | Cumulative Rainfall during Sampling Period (in) |
|-----------------|----------------------|------------------|-----------------|------------------------|---------------------|--------------------------------------|---|---------------------|---|
| A | 2-371 | Yes | 2 | 3/16/2010 ¹ | 4/2/2010 | 17,958 | NA | 3/29/2010 | 11.2 |
| B | 3-307 | No | 3 | 2/5/2010 | 4/7/2010 | 4750 | 23 | 2/12/2010 | 6.9 |
| G | discharge | NA | NA | NA | NA | NA | NA | 11/9/2009 | NA |
| I | 4-283 | No | 3 | 11/23/2009 | 2/5/2010 | 12,534 | 45 | NA | 9.8 |
| J | 18-249 | No | 1 | 11/3/2009 | 1/8/2010 | 2,568 ² | 104 | 11/13/2009 | 6.9 |
| | 18-505A ³ | No | 1 | 1/12/2010 | 3/9/2010 | 4,290 | 109 | 2/3/2010 | 3.4 |
| | | | 3 | 4/13/2010 | 4/22/2010 | 4,637 | 80 | NA | 0.33 |
| V | 2-44 gate valve | Yes | NA | NA | NA | NA | NA | 11/9/2009 | NA |
| Z | 36-131 | Yes | 2 | 1/8/2010 | 3/3/2010 | 9,537 | 67 | 2/26/2010 | 5.4 |

Notes:

1. Sampling initiated on 3/5. On 3/16, pump was found upset and running continuously. Pump was re-secured and a second filter bag was placed on 3/16. First sample was not submitted for analysis due to tidal interference.
2. Flow totalizer found broken mid-way through sampling period; actual flow volume is likely greater.
3. First line J filter bag sample was found tainted with hydrated bentonite that had leaked from sandbags placed to dam the vault. The bag was submitted for analysis, and the sandbags were removed and replaced with a permanent brick and mortar dam. A second filtered solids sample was subsequently collected.
4. NA - Not analyzed or not applicable.

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TABLE 3

Filter Bag Information and Data Conversion Equation

Stormwater Source Control Round 4 Sampling Report
Boeing Plant 2

| | | | | | | | |
|--|-------------------|-------------------|-------------------|----------------------|------------------------------------|-----------------------|-------------------|
| Lab SDG: | QR17 | QR83 | QI75 | QE75 | QO78 | QT80 | QM32 |
| Golder Sample ID: | PL2SC-SS-A-040210 | PL2SC-SS-B-040710 | PL2SC-SS-I-020510 | PL2SC-SS-J249-010810 | PL2SC-SS-J505A-030910 ³ | PL2SC-SS-J505A-042210 | PL2SC-SS-Z-022610 |
| Filter Bag ID: | FB-036 | FB-039 | FB-021 | FB-041 | FB-007 | FB-004 | FB-040 |
| | | | | | | | |
| Initial Dry Weight of Sample Bag (g): | 99.97 | 102.18 | 101.22 | 99.93 | 97.73 | 100.70 | 99.04 |
| Final Dry Weight (g) ¹ : | NM | 125.54 | 146.67 | 204.34 | 206.39 | 180.68 | 166.06 |
| Total Solids Mass in Filter (Final Dry Weight - Initial Dry Weight of Sample Bag) (g): | NM | 23.4 | 45.45 | 104.41 | 108.66 | 79.98 | 67.02 |
| Volume of water pumped through filter (gal): | 17958 | 4750 | 12534 | 2568 ² | 4290 | 4637 | 9537 |

- Notes:
- 1. Dry weight after solids split is removed for metals analysis.
 - 2. Flow totalizer found broken mid-way through sampling period; actual flow volume is likely greater.
 - 3. Filter bag found tainted with bentonite. Second sample collected.
 - 4. NM = Not measured

Equation 1

Conversion Calculation (to µg/kg-solids):
(For data reported in Total µg)

$$\frac{AnalyteMass}{TotalSolidsMass} * 1000g / kg$$

Analyte Mass: Per-sample result reported by the laboratory (µg)
Total Solids Mass: Total Solids Mass in Filter (Final Dry Weight - Initial Dry Weight of Sample Bag) (g):

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TABLE 4

Analytical Results for Suspended Solids Samples

Stormwater Source Control Round 4 Sampling Report
Boeing Plant 2

| | | | | Line A (2-371) | | | | | Line B (3-307) | | | | Line I (4-283) | | | |
|--------------|--------|-----------------------------|------------|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Constituent | Method | Source Control Action Level | Sample ID: | Round 1 | Round 2 | Round 3 | | Round 4 | Round 1 | Round 2 | Round 3 | Round 4 | Round 1 | Round 2 | Round 3 | Round 4 |
| | | | | PL2SC-SS-A-041907 | PL2SC-SS-A-032608 | PL2SC-SS-A-031909 ⁴ | PL2SC-SS-A-050709 | PL2SC-SS-A-040210 | PL2SC-SS-B-031407 | PL2SC-SS-B-041108 | PL2SC-SS-B-050709 | PL2SC-SS-B-040710 | PL2SC-SS-I-010207 | PL2SC-SS-I-112807 PL2SC-SS-I-052908 (Hg only) | PL2SC-SS-I-120308 | PL2SC-SS-I-020510 |
| | | | | (mg/kg-dry) ² | (mg/kg-dry) ² | (mg/kg-dry) ² | (mg/kg-dry) ² | (mg/kg-dry) ² | (mg/kg-dry) ² | (mg/kg-dry) ² | (mg/kg-dry) ² | (mg/kg-dry) ² | | (mg/kg-dry) ² | (mg/kg-dry) ² | (mg/kg-dry) ² |
| Metals | | | | | | | | | | | | | | | | |
| Arsenic | 7060A | 93 | | 11 | 2.9 | NA | 29 | 30.3 | 10 | 16 | 10.1 | 19 | NA | 38 J | 19 | 28.3 |
| Cadmium | 6010B | 6.7 | | 11.6 | 4.9 | NA | 31 | 6.9 | 10 | 6.8 | 7.5 | 8 | NA | 10 | 2 | 4.6 |
| Chromium | 6010B | 270 | | 64.1 | 41 | NA | 124 | 57.4 | 131 | 238 | 388 | 425 | NA | 279 | 103 | 336 |
| Copper | 6010B | 390 | | 115 | 48.3 | NA | 182 | 114 | 196 | 320 | 254 | 294 | NA | 466 | 113 | 235 |
| Lead | 7421 | 530 | | 93 | 23 | NA | 175 | 114 | 540 | 610 | 512 | 479 | NA | 790 J | 180 | 229 |
| Mercury | 7471A | 0.59 | | 0.12 | 0.07 U | NA | 0.4 | 0.20 | 0.3 U | 0.2 | 0.3 | 0.6 | NA | 0.3 | 0.3 U | 0.4 |
| Silver | 6010B | 6.1 | | 0.7 | 0.4 U | NA | 2 U | 0.3 U | 2 | 3 | 2 | 3 | NA | 2 U | 2 U | 1 U |
| Zinc | 6010B | 960 | | 1280 | 724 | NA | 2500 | 706 | 2180 | 2040 | 1810 | 2110 | NA | 3020 | 676 | 1430 |
| PCBs | | | | Estimated Concentration (µg/kg-solids) ³ | Estimated Concentration (µg/kg-solids) ³ | Estimated Concentration (µg/kg-solids) ^{3,4} | Estimated Concentration (µg/kg-solids) ³ | Estimated Concentration (µg/kg-solids) ³ | Estimated Concentration (µg/kg-solids) ³ | Estimated Concentration (µg/kg-solids) ³ | Estimated Concentration (µg/kg-solids) ³ | Estimated Concentration (µg/kg-solids) ³ | Estimated Concentration (µg/kg-solids) ³ | Estimated Concentration (µg/kg-solids) ³ | Estimated Concentration (µg/kg-solids) ³ | Estimated Concentration (µg/kg-solids) ³ |
| Aroclor 1016 | 8082 | | | 89 U | NA | 70 U | NA | NA | 1294 U | 123 U | 331 U | 214 U | 554 U | 1765 U | 731 U | 220 U |
| Aroclor 1242 | 8082 | | | 89 U | NA | 70 U | NA | NA | 1294 U | 123 U | 331 U | 214 U | 554 U | 1765 U | 731 U | 220 U |
| Aroclor 1248 | 8082 | | | 260 | NA | 70 U | NA | NA | 1294 U | 123 U | 331 U | 321 UY | 554 U | 1765 U | 731 U | 220 U |
| Aroclor 1254 | 8082 | | | 156 | NA | 126 | NA | NA | 1294 U | 370 | 370 | 514 UY | 1551 | 3353 | 731 U | 880 UY |
| Aroclor 1260 | 8082 | | | 89 U | NA | 119 | NA | NA | 2407 | 962 | 767 | 1284 | 3878 | 2824 | 1447 | 1672 |
| Aroclor 1221 | 8082 | | | 89 U | NA | 70 U | NA | NA | 1294 U | 123 U | 331 U | 214 U | 554 U | 1765 U | 731 U | 220 U |
| Aroclor 1232 | 8082 | | | 89 U | NA | 70 U | NA | NA | 1294 U | 123 U | 331 U | 214 U | 554 U | 1765 U | 731 U | 220 U |
| Total PCB | | 1000 | | 416 | NA | 244 | NA | NA | 2407 | 1333 | 1137 | 1284 | 5429 | 6177 | 1447 | 1672 |

- Notes:
1. NA - Not analyzed or not applicable.
 2. Metals data reported in mg/kg-dry solids.
 3. PCB laboratory data was reported in total mass (µg) per analysis. The estimated concentration in µg/kg-solids was calculated using Equation 1, Table 3.
 4. This sample was incorrectly submitted for PCB analysis, which was eliminated from the sampling matrix on the basis of round 1 results for line A (Golder, 2007).
 5. Sample was found tainted with hydrated bentonite; a second sample was subsequently collected from this location.
 6. U - The target analyte was not detected at the reported concentration.
 7. J - Estimated concentration.

TABLE 4

Analytical Results for Suspended Solids Samples
Stormwater Source Control Round 4 Sampling Report
Boeing Plant 2

| | | | | Line J (18-249) | | | | Line J (18-505A) | | | | | Line Z (36-131) | | | |
|--------------|--------|-----------------------------|------------|---|---|---|---|------------------|---|---|---|---|---|---|---|---|
| Constituent | Method | Source Control Action Level | Sample ID: | Round 1 | Round 2 | Round 3 | Round 4 | Round 1 | Round 2 | Round 3 | Round 4 | | Round 1 | Round 2 | Round 3 | Round 4 |
| | | | | PL2SC-SS-J249-111506 | PL2SC-SS-J249-111207 | PL2SC-SS-J249-021209 | PL2SC-SS-J249-010810 | | PL2SC-SS-J505-021508 | PL2SC-SS-J505-041709 | PL2SC-SS-J505A-030910 ⁵ | PL2SC-SS-J505A-042210 | PL2SC-SS-Z-021607 | PL2SC-SS-Z-011408 | PL2SC-SS-Z-010809 | PL2SC-SS-Z-030310 |
| | | | | | (mg/kg-dry) ² | (mg/kg-dry) ² | (mg/kg-dry) ² | | (mg/kg-dry) ² | (mg/kg-dry) ² | (mg/kg-dry) ² | (mg/kg-dry) ² | | (mg/kg-dry) ² | (mg/kg-dry) ² | (mg/kg-dry) ² |
| Metals | | | | NA | 13 J | 26 | 12.7 | NA | 12.2 | 7.7 | 4 | 11 | NA | 18 | 35 | 26.5 |
| Arsenic | 7060A | 93 | | NA | | | | NA | | | | | NA | | | |
| Cadmium | 6010B | 6.7 | | NA | 9 | 7 | 7 | NA | 4.5 | 3.6 | 2 | 4 | NA | 2 | 3.4 | 2.7 |
| Chromium | 6010B | 270 | | NA | 170 | 176 | 149 | NA | 256 | 214 | 146 | 164 | NA | 296 | 164 | 262 |
| Copper | 6010B | 390 | | NA | 880 | 2330 | 839 | NA | 723 | 575 | 350 | 414 | NA | 210 | 137 | 274 |
| Lead | 7421 | 530 | | NA | 380 | 390 | 404 | NA | 410 | 208 | 110 | 307 | NA | 124 | 251 | 229 |
| Mercury | 7471A | 0.59 | | NA | 0.6 | 0.5 | 0.85 | NA | 0.5 | 0.4 | 0.3 | 0.4 | NA | 0.3 | 0.3 | 0.3 |
| Silver | 6010B | 6.1 | | NA | 2 U | 4 | 8 | NA | 1 | 1 U | 2 U | 2 U | NA | 2 U | 1 U | 1.1 |
| Zinc | 6010B | 960 | | NA | 3790 | 5870 | 3620 | NA | 2230 | 1990 | 1120 | 1990 | NA | 837 | 836 | 985 |
| PCBs | | | | Estimated Concentration (µg/kg-solids) ³ | Estimated Concentration (µg/kg-solids) ³ | Estimated Concentration (µg/kg-solids) ³ | Estimated Concentration (µg/kg-solids) ³ | | Estimated Concentration (µg/kg-solids) ³ | Estimated Concentration (µg/kg-solids) ³ | Estimated Concentration (µg/kg-solids) ³ | Estimated Concentration (µg/kg-solids) ³ | Estimated Concentration (µg/kg-solids) ³ | Estimated Concentration (µg/kg-solids) ³ | Estimated Concentration (µg/kg-solids) ³ | Estimated Concentration (µg/kg-solids) ³ |
| Aroclor 1016 | 8082 | | | 955 U | 510 U | 1423 U | 958 U | NA | 97 U | 359 U | 18 U | 63 U | 375 U | 119 U | 146 U | 373 U |
| Aroclor 1242 | 8082 | | | 955 U | 510 U | 1423 U | 958 U | NA | 97 U | 359 U | 166 | 63 U | 375 U | 119 U | 146 U | 373 U |
| Aroclor 1248 | 8082 | | | 955 U | 510 U | 1423 U | 958 U | NA | 97 U | 359 U | 18 U | 93 UY | 375 U | 238 U | 175 | 925 UY |
| Aroclor 1254 | 8082 | | | 1551 | 550 | 1423 U | 1724 UY | NA | 271 | 416 | 515 J | 150 | 750 | 618 | 335 | 1492 J |
| Aroclor 1260 | 8082 | | | 4893 | 1549 | 2705 | 3831 | NA | 387 | 674 | 672 | 138 | 1125 | 808 | 437 | 1641 |
| Aroclor 1221 | 8082 | | | 955 U | 510 U | 1423 U | 958 U | NA | 97 U | 359 U | 18 U | 63 U | 375 U | 119 U | 146 U | 373 U |
| Aroclor 1232 | 8082 | | | 955 U | 510 U | 1423 U | 958 U | NA | 97 U | 359 U | 18 U | 63 U | 375 U | 119 U | 146 U | 373 U |
| Total PCB | | 1000 | | 6444 | 2100 | 2705 | 3831 | NA | 658 | 1090 | 1353 | 288 | 1875 | 1426 | 947 | 3133 |

- Notes:
- 1. NA - Not analyzed or not applicable.
 - 2. Metals data reported in mg/kg-dry solids.
 - 3. PCB laboratory data was reported in total mass (µg) per analysis. The estimated concentration in µg/kg-solids was calculated using Equation 1, Table 3.
 - 4. This sample was incorrectly submitted for PCB analysis, which was eliminated from the sampling matrix on the basis of round 1 results for line A (Golder, 2007).
 - 5. Sample was found tainted with hydrated bentonite; a second sample was subsequ
 - 6. U - The target analyte was not detected at the reported concentration.
 - 7. J - Estimated concentration.

TABLE 5

Analytical Results for Detected Constituents in Water Samples

Stormwater Source Control Round 4 Sampling Report
Boeing Plant 2

| | | | | Line A (2-371) | | | | Line B (3-307) | | | | Line G (Outfall) | | | | Line I (4-283) | | |
|----------------------------|-------------|-----------------------------|--------------|----------------|----------|----------|-----------|----------------|-----------|-----------|-----------|------------------|-----------|----------|-----------|----------------|------------|------------|
| | | | | Round 1 | Round 2 | Round 3 | Round 4 | Round 1 | Round 2 | Round 3 | Round 4 | Round 1 | Round 2 | Round 3 | Round 4 | Round 1 | Round 2 | Round 3 |
| Constituent | Method | Source Control Action Level | Sample Date: | 4/9/2007 | 3/3/2008 | 3/5/2009 | 3/29/2010 | 3/7/2007 | 3/10/2008 | 3/28/2009 | 2/12/2010 | 10/18/2006 | 10/2/2007 | 1/6/2009 | 11/9/2009 | 1/2/2007 | 11/28/2007 | 11/20/2008 |
| SVOCs (µg/L) | | | | | | | | | | | | | | | | | | |
| bis(2-ethylhexyl)phthalate | 8270D | 2.2 | | 1.0 U | NA | NA | NA | NA | NA | NA | NA | 2.2 U | 1.2 J | 2.4 | 1.0 U | 2.3 U | NA | NA |
| Chrysene | 8270DSIM | 0.1 | | 0.1 U | NA | NA | NA | NA | NA | NA | NA | 0.13 | 0.1 U | 0.1 U | 0.1 U | 0.1 U | NA | NA |
| Phenanthrene | 8270DSIM | | | 0.1 U | NA | NA | NA | NA | NA | NA | NA | 0.1 U | 0.1 U | 0.12 | 0.1 U | 0.1 U | NA | NA |
| Dissolved Metals (µg/L) | | | | | | | | | | | | | | | | | | |
| Arsenic | 7060A/200.8 | 36 | | 2 | 2 | 1 U | 2.6 | 1 U | 1 U | 1 U | 0.2 U | NA | NA | NA | NA | 1 U | 1 U | 1 U |
| Copper | 6010B | 3.1 | | 2 U | 2 | 2 | 2 U | 4 | 7 | 4 | 2 U | NA | NA | NA | NA | 2 U | 3 U | 2 U |
| Zinc | 6010B | 81 | | 110 | 400 | 290 | 10 U | 178 | 136 | 50 | 180 | NA | NA | NA | NA | 24 | 32 | 60 J+ |

| | | | | Line J (18-249) | | | | Line J (18-505A) | | | | Line V (2-44 Gate Valve) | | | | | | | | Line Z (36-131) | | | |
|----------------------------|----------|-----------------------------|--------------|-----------------|------------|-----------|------------|------------------|----------|-----------|----------|--------------------------|---------------------|------------|----------------------|----------|--------------------|-----------|---------------------|-----------------|------------|----------|-----------|
| | | | | Round 1 | Round 2 | Round 3 | Round 4 | Round 1 | Round 2 | Round 3 | Round 4 | Round 1 | | Round 2 | | Round 3 | | Round 4 | | Round 1 | Round 2 | Round 3 | Round 4 |
| Constituent | Method | Source Control Action Level | Sample Date: | 11/15/2006 | 11/12/2007 | 2/23/2009 | 11/13/2009 | 2/28/2007 | 2/5/2008 | 3/28/2009 | 2/3/2010 | 11/3/2006 | Duplicate 11/3/2006 | 10/18/2007 | Duplicate 10/18/2007 | 1/6/2009 | Duplicate 1/6/2009 | 11/9/2009 | Duplicate 11/9/2009 | 2/14/2007 | 12/18/2008 | 1/7/2009 | 2/26/2010 |
| SVOCs (µg/L) | | | | | | | | | | | | | | | | | | | | | | | |
| bis(2-ethylhexyl)phthalate | 8270D | 2.2 | | 1.5 | NA | NA | NA | 1.0 U | NA | NA | NA | 1 U | 1.1 U | NA | NA | NA | NA | NA | NA | 1.0 U | NA | NA | NA |
| Chrysene | 8270DSIM | 0.1 | | 0.1 UJ | NA | NA | NA | 0.1 U | NA | NA | NA | 0.1 U | 0.1 U | NA | NA | NA | NA | NA | NA | 0.1 U | NA | NA | NA |
| Phenanthrene | 8270DSIM | | | 0.1 UJ | NA | NA | NA | 0.1 U | NA | NA | NA | 0.1 U | 0.1 U | NA | NA | NA | NA | NA | NA | 0.1 U | NA | NA | NA |
| Dissolved Metals (µg/L) | | | | | | | | | | | | | | | | | | | | | | | |
| Arsenic | 7060A | 36 | | 1 U | 1 U | 1 U | 0.2 | 1 U | 1 U | 1 U | 0.3 | 1 | 2 | 1 U | 1 | 2 | 1 | 1.3 | 1.2 | 1 | 2 | 2 | 1 |
| Copper | 6010B | 3.1 | | 6 U | 14 | 8 J+ | 5 | 10 | 4 | 10 J+ | 9 | 18 | 12 | 10 | 10 | 4 | 3 | 2 U | 2 | 5 | 2 U | 2 U | 2 U |
| Zinc | 6010B | 81 | | 81 | 138 | 60 | 80 J+ | 98 | 122 | 90 | 60 | 74 | 108 | 27 | 22 | 230 | 230 | 40 | 40 | 45 | 23 | 32 | 30 |

- Notes:
1. Metals results were field filtered (0.45 µm) and represent dissolved concentrations.
 2. NA - Not analyzed
 3. U - Indicates that the target analyte was not detected at the reported concentration.
 4. B - Analyte detected in an associated method blank at a concentration greater than one-half of laboratory's reporting limit or 5% of the analyte concentration in the sample.
 5. J - Estimated concentration.
 6. J+ - Elevated (estimated) result due to equipment blank contamination.

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2010-2011 Sampling Matrix

Stormwater Source Control Round 4 Sampling Report
Boeing Plant 2

| Stormwater Line | Sampling Point | Suspended Solids | Water |
|-----------------|-----------------|---------------------------------|---|
| A | 2-371 | SMS metals ¹ | SMS metals (dissolved) ² PCBs (whole water) |
| B | 3-307 | PCBs SMS metals ¹ | SMS metals (dissolved) PCBs (whole water) |
| G | discharge | NS | SVOCs |
| I | 4-283 | PCBs SMS metals ¹ | PCBs (whole water) |
| J | 18-249 | PCBs SMS metals ¹ | SMS metals (dissolved) PCBs (whole water) |
| | 18-505A | PCBs SMS metals ¹ | SMS metals (dissolved) PCBs (whole water) |
| V | 2-44 gate valve | NS | SMS metals (dissolved) |
| Z | 36-131 | PCBs SMS metals ¹ | PCBs (whole water) |

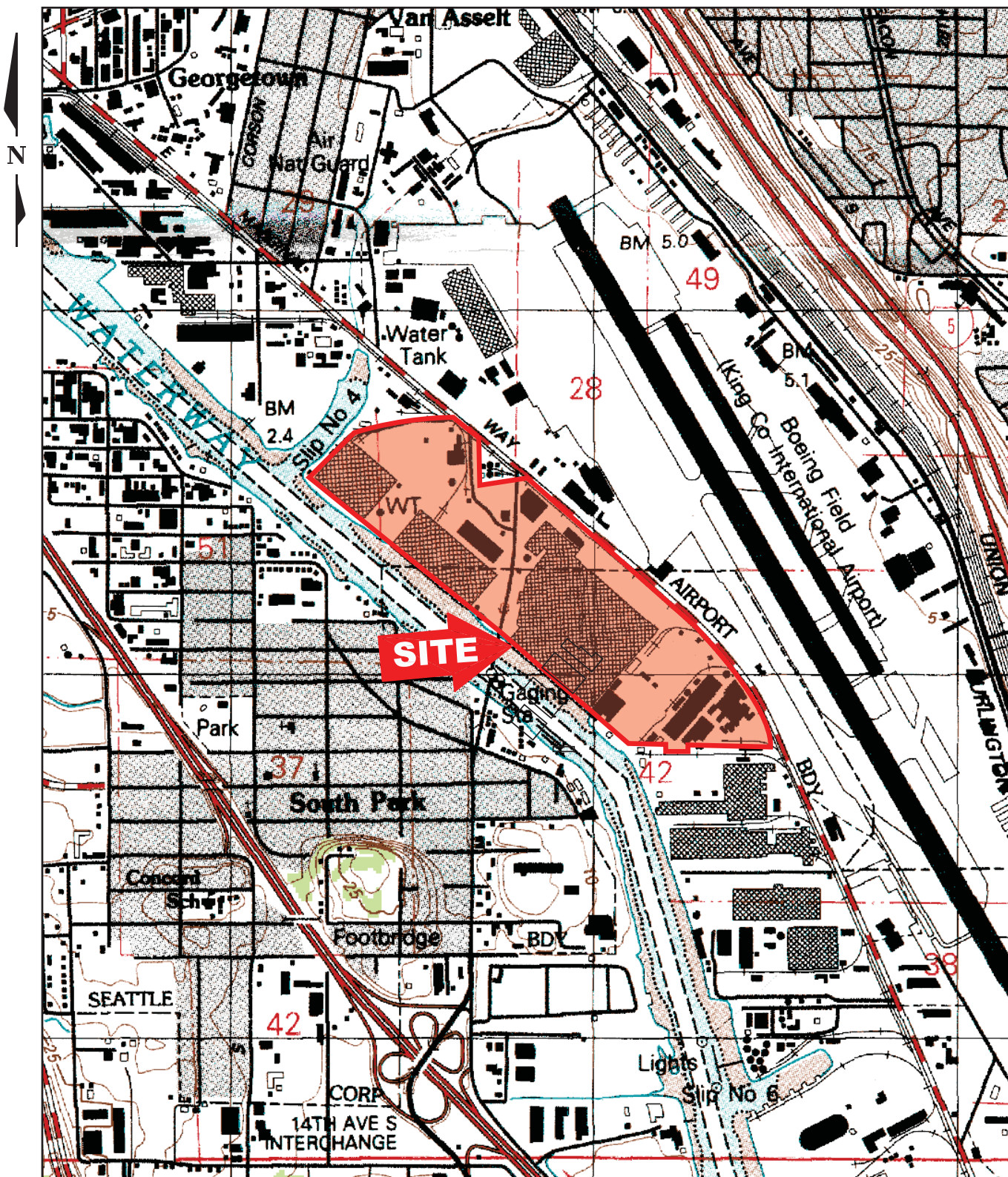
Notes:

1. Metals analysis for suspended solids samples will be contingent upon adequate solids mass recovery.
2. Water samples for metals analysis are field-filtered using a 0.45 micron filter.
3. SMS -State of Washington Sediment Management Standards (Chapter 173-204 WAC)
4. NS -Not sampled

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FIGURES

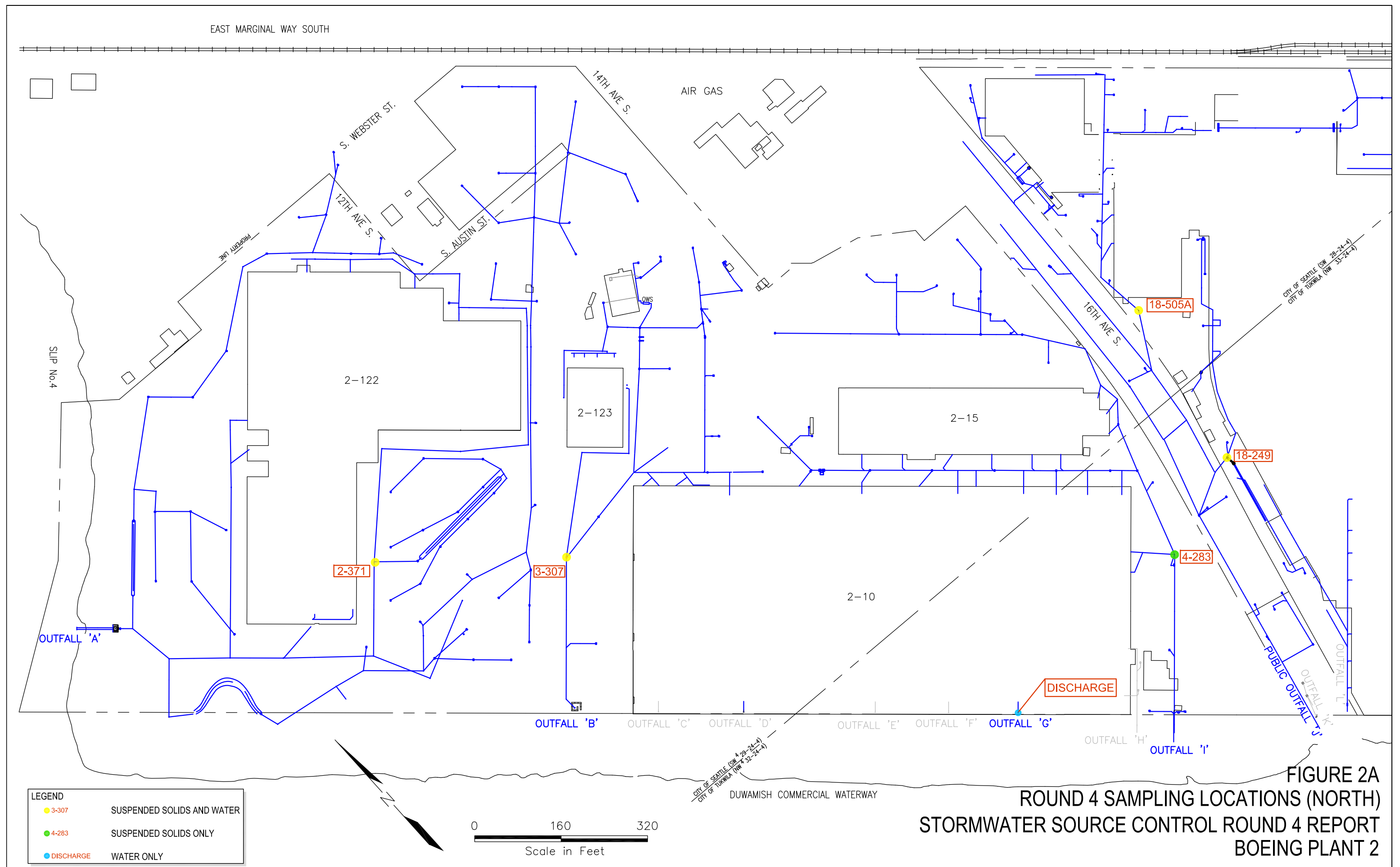
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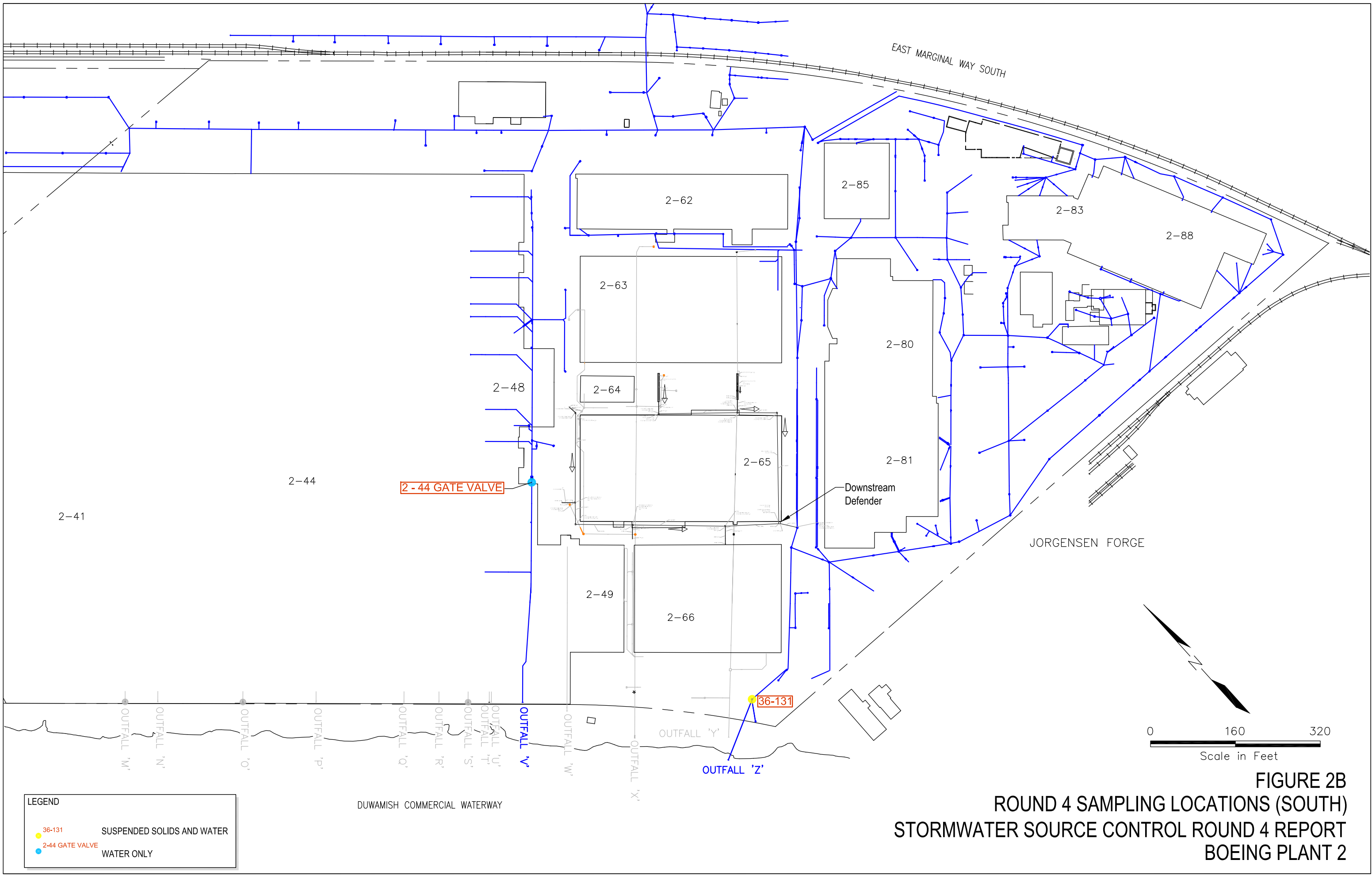


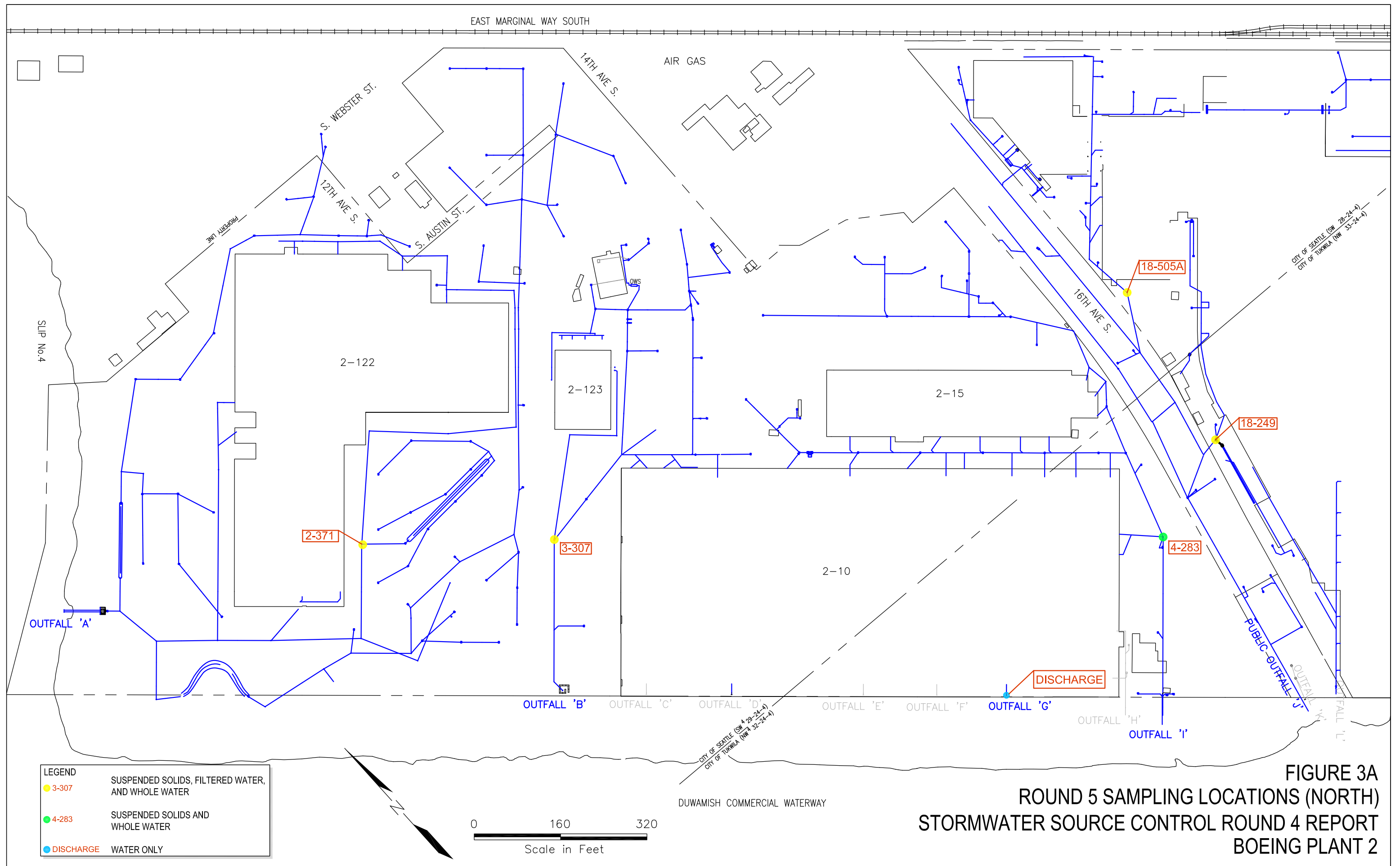
Stormwater Source Control
Round 4 Report
Boeing Plant 2
Seattle/Tukwila, Washington

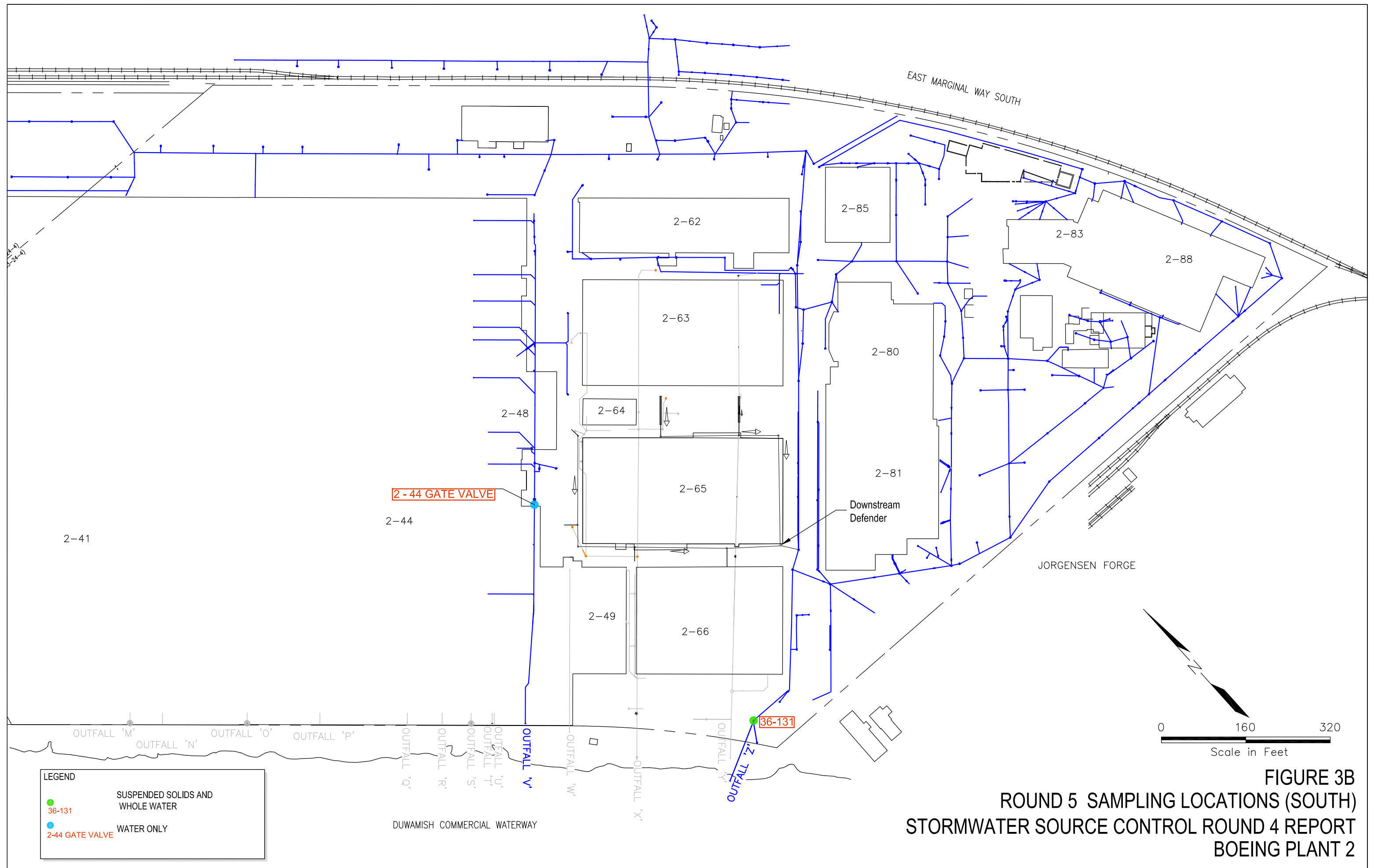
Figure 1
Vicinity Map

| SHEET | DRAWN BY | REVIEWED BY | DATE |
|--------|----------|-------------|----------|
| 1 of 1 | JDD | AMP | 04/26/10 |









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ATTACHMENT A

SOURCE CONTROL SAMPLE COLLECTION FORMS

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Source Control Sample Collection Form

Boeing Plant 2, Seattle/Tukwila, Washington

| | | | | |
|----------------------------|---|---|-----------------------------|----------------------------|
| Stormwater Line: | <u>A</u> | | Station: | <u>2-371</u> |
| Sample Type: | <input checked="" type="checkbox"/> Suspended Solids/Whole Water <input type="checkbox"/> Whole Water Only | | Suspended Solids Sample ID: | <u>PL2SC-SS-A-04022010</u> |
| Initial Flowmeter Reading: | <u>35486.4</u> | | Water Sample ID: | <u>PL2SC-W-A-032910</u> |
| Final Flowmeter Reading: | <u>53444.5</u> | Total Rainfall: <u>283.2mm = 11.15 in</u> | Field Team (Initials): | <u>LS, TN</u> |
| Weather/Field Conditions: | <u>3/5/2010 - Sunny, warm</u> <u>4/2 - overcast, sporadic rain</u> | | Sampling Start Date: | <u>3/5/2010 **</u> |
| | | | Sampling End Date: | <u>4/2/2010</u> |

Water Sampling Information

Water Sampling Date: 3/29/10
 Water Sampling Time: 1135
 Gallons Pumped: 11606.6

Sample Collection Method (Check One)

Submersible Pump ☒
 Peristaltic Pump ☐
 Pole-Mounted Bottle Dipper (water only) ☐
 Hand (water only) ☐
 Other ☐

| Date | Time | Turbidity (NTU) | pH | Temp (°C) | Cond (μ S/cm OR mS/cm) | Appearance |
|----------------|-------------|-----------------|--------------|-------------|-----------------------------|--------------|
| <u>3/29/10</u> | <u>1135</u> | <u>3.51</u> | <u>Lab *</u> | <u>10.8</u> | <u>1154</u> | <u>clear</u> |

Water Samples

Sample Collection Time: 1135
 Number of Bottles: 3

| Bottle Type/Preservative | Number Filled | Analysis | Field Filtered (Y/N) | Comments |
|---------------------------------------|---------------|----------------|----------------------|----------|
| <u>1L / HNO₃ / Poly</u> | <u>1</u> | <u>Smsrmet</u> | <u>Y</u> | |
| <u>500mL / HNO₃ / Poly</u> | <u>1</u> | <u>LLHg</u> | <u>Y</u> | |
| <u>500mL / None / Poly</u> | <u>1</u> | <u>pH</u> | <u>N</u> | |
| | | | | |

Suspended Solids Samples

Filtration Start Date: 3/5/2010
 Filtration End Date: 4/2/2010
 Total Volume Filtered: 17958.1

Filter Bags Collected: 2**
 Filter Bag #: FB-035 / FB-036
 Initial Dry Weight: 102.37g / 99.97g

not analyzed

* malfunctioning pH meter - collected extra volume for lab to analyze pH
 ** 3/16/2010 - onsite to re-set tide timer. Found over 20,000 gal had run through sampler w/ only ~25 mm rain.
 Found hose kinked, pump lying flat on side (i.e., always on when timer on). Pulled out pump, un-kinked hose, repositioned in basin, and secured to side of vault. Replaced w/ fresh filter bag (FB-036).
 Initial Flow = 35486.4 gal Empied rain gauge.
 First filter bag not submitted for analysis due to tidal interference.

Source Control Sample Collection Form

Boeing Plant 2, Seattle/Tukwila, Washington

| | | | |
|----------------------------|---|-----------------------------|--------------------------|
| Stormwater Line: | <u>B</u> | Station: | <u>3-307</u> |
| Sample Type: | <input checked="" type="checkbox"/> Suspended Solids/Whole Water | Suspended Solids Sample ID: | <u>PL2SC-SS-B-040710</u> |
| | <input type="checkbox"/> Whole Water Only | Water Sample ID: | <u>PL2SC-W-B-021210</u> |
| Initial Flowmeter Reading: | <u>3966/gal</u> | Field Team (Initials): | <u>LS; JL; KM</u> |
| Final Flowmeter Reading: | <u>44410.5gal</u> | Sampling Start Date: | <u>2/5/2010</u> |
| Total Rainfall: | <u>176.2 mm = 6.94 in</u> | Sampling End Date: | <u>4/7/2010</u> |
| Weather/Field Conditions: | <u>2/5/10 - sunny, warm</u> <u>2/12/10 - sporadic rain, warm</u> <u>4/7/10 - cloudy</u> | | |

Water Sampling Information

Water Sampling Date: 2/12/2010
Water Sampling Time: 17:05
Gallons Pumped: 225

Sample Collection Method (Check One)

Submersible Pump ☒
Peristaltic Pump ☐
Pole-Mounted Bottle Dipper (water only) ☐
Hand (water only) ☐
Other ☐

| Date | Time | Turbidity (NTU) | pH | Temp (°C) | Cond (μ S/cm) OR mS/cm | Appearance |
|------------------|-------------|-----------------|-------------|-----------|-----------------------------|--------------|
| <u>2/12/2010</u> | <u>1700</u> | <u>4.13</u> | <u>LAB*</u> | <u>11</u> | <u>65.3</u> | <u>clear</u> |

Water Samples

Sample Collection Time: 17:05
Number of Bottles: 3

| Bottle Type/Preservative | Number Filled | Analysis | Field Filtered (Y/N) | Comments |
|-------------------------------------|---------------|----------------|----------------------|----------|
| <u>1L Poly / HNO₃</u> | <u>1</u> | <u>SMS met</u> | <u>Y</u> | |
| <u>500mL Poly / HNO₃</u> | <u>1</u> | <u>LLHg</u> | <u>Y</u> | |
| <u>500mL Poly</u> | <u>1</u> | <u>pH</u> | <u>N</u> | |
| | | | | |
| | | | | |

Suspended Solids Samples

Filtration Start Date: 2/5/2010
Filtration End Date: 4/7/2010
Total Volume Filtered: 4749.5

Filter Bags Collected: 1
Filter Bag #: FB-040
Initial Dry Weight: 99.04g

* pH meter appears to be malfunctioning - collected extra volume for lab to analyze pH.

3/22/2010: Installed wood and mortar dam in vault to allow water level to rise sufficiently to trigger pump. (Flat-flow-through location). Installed by Bravo Environmental (confined-space entry).

Source Control Sample Collection Form

Boeing Plant 2, Seattle/Tukwila, Washington

Stormwater Line:

6

Sample Type:

- ☐ Suspended Solids/Whole Water
☒ Whole Water Only

Station:

Outfall

Suspended Solids Sample ID:

N/A

Water Sample ID:

PL2SC-W-6-110909

Field Team (Initials):

LS; JL

Sampling Start Date:

11/9/09

Sampling End Date:

N/A

Initial Flowmeter Reading:

N/A

Final Flowmeter Reading:

N/A

Total Rainfall:

N/A

Weather/Field Conditions:

rainy, rain ending

Water Sampling Information

Water Sampling Date:

11/9/09

Water Sampling Time:

1324

Gallons Pumped:

N/A

Sample Collection Method (Check One)

Submersible Pump

☐

Peristaltic Pump

☐

Pole-Mounted Bottle Dipper (water only)

☐

Hand (water only)

☒

Other

☐

| Date | Time | Turbidity (NTU) | pH | Temp (°C) | Cond (µS/cm) OR mS/cm | Appearance |
|---------|------|-----------------|-------|-----------|-----------------------|------------|
| 11/9/09 | 1322 | 8.71 1.08 | 8.71* | 13.3 | 10.7 | clear |

LS

Water Samples

Sample Collection Time:

1324

Number of Bottles:

4

| Bottle Type/Preservative | Number Filled | Analysis | Field Filtered (Y/N) | Comments |
|--------------------------|---------------|----------|----------------------|----------|
| 500 mL amber | 2 | SVOC | N | |
| 500 mL amber | 2 | SVOC SIM | N | |
| | | | | |
| | | | | |
| | | | | |

Suspended Solids Samples

Filtration Start Date: N/A

Filter Bags Collected: 0

Filtration End Date: N/A

Filter Bag #: N/A

Total Volume Filtered: N/A

Initial Dry Weight: N/A

* suspect pH meter may be malfunctioning

Source Control Sample Collection Form

Boeing Plant 2, Seattle/Tukwila, Washington

| | | | |
|--|--|-----------------------------|--------------------------|
| Stormwater Line: | <u>I</u> | Station: | <u>4-283</u> |
| Sample Type: | <input checked="" type="checkbox"/> Suspended Solids/ Whole Water | Suspended Solids Sample ID: | <u>PL2SC-SS-I-020510</u> |
| | <input type="checkbox"/> Whole Water Only | Water Sample ID: | <u>NA</u> |
| Initial Flowmeter Reading: | <u>27126.4 ml</u> | Field Team (Initials): | <u>LS, JL</u> |
| Final Flowmeter Reading: | <u>39660.4 g</u> | Sampling Start Date: | <u>11/23/09</u> |
| Weather/Field Conditions: | <u>11/23 - warm, overcast</u> <u>2/5 - sunny, warm</u> | Sampling End Date: | <u>02/05/10</u> |
| Total Rainfall: <u>249 mm = 9.8 in</u> | | | |

Water Sampling Information

| | |
|----------------------|-----------|
| Water Sampling Date: | <u>NA</u> |
| Water Sampling Time: | <u>NA</u> |
| Gallons Pumped: | |

Sample Collection Method (Check One)

| | |
|---|--------------------------|
| Submersible Pump | <input type="checkbox"/> |
| Peristaltic Pump | <input type="checkbox"/> |
| Pole-Mounted Bottle Dipper (water only) | <input type="checkbox"/> |
| Hand (water only) | <input type="checkbox"/> |
| Other _____ | <input type="checkbox"/> |

| Date | Time | Turbidity (NTU) | pH | Temp (°C) | Cond (µS/cm OR mS/cm) | Appearance |
|------|------|-----------------|----|-----------|-----------------------|------------|
| | | | | | | |

Water Samples

| | |
|-------------------------|--|
| Sample Collection Time: | |
| Number of Bottles: | |

| Bottle Type/Preservative | Number Filled | Analysis | Field Filtered (Y/N) | Comments |
|--------------------------|---------------|----------|----------------------|----------|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

Suspended Solids Samples

| | | | |
|------------------------|-------------------|--------------------------|----------------|
| Filtration Start Date: | <u>11/23/09</u> | # Filter Bags Collected: | <u>1</u> |
| Filtration End Date: | <u>2/5/10</u> | Filter Bag #: | <u>FB-021</u> |
| Total Volume Filtered: | <u>12,534 gal</u> | Initial Dry Weight: | <u>101.22g</u> |

Source Control Sample Collection Form

Boeing Plant 2, Seattle/Tukwila, Washington

Stormwater Line:

J

Sample Type:

- ☒ Suspended Solids/Whole Water
☐ Whole Water Only

Station:

18-249

Suspended Solids Sample ID:

PL2SC-SS-J249-010810

Water Sample ID:

PL2SC-W-J249-111309

Field Team (Initials):

LS, JL

Sampling Start Date:

11/13/09

Sampling End Date:

01/08/10

Initial Flowmeter Reading:

86.5 gal*

Final Flowmeter Reading:

821.8 gal

Total Rainfall:

176.4mm = 6.9 in

Weather/Field Conditions:

11/13/09 - rainy, cold
01/08/10 - rainy, cold

Water Sampling Information

Water Sampling Date:

11/13/09

Water Sampling Time:

0823

Gallons Pumped:

20

Sample Collection Method (Check One)

Submersible Pump

☒

Peristaltic Pump

☐

Pole-Mounted Bottle Dipper (water only)

☐

Hand (water only)

☐

Other

☐

| Date | Time | Turbidity (NTU) | pH | Temp (°C) | Cond (µS/cm) OR mS/cm | Appearance |
|-----------------|------------|-----------------|---------------|------------|-----------------------|--------------|
| <u>11/13/09</u> | <u>820</u> | <u>4.20</u> | <u>9.03**</u> | <u>8.2</u> | <u>31.9</u> | <u>clear</u> |

Water Samples

Sample Collection Time:

823

Number of Bottles:

2

| Bottle Type/Preservative | Number Filled | Analysis | Field Filtered (Y/N) | Comments |
|-----------------------------------|---------------|-------------------|----------------------|----------|
| <u>1L/HNO₃ Poly</u> | <u>1</u> | <u>SMS Metals</u> | <u>Y</u> | |
| <u>500mL Poly/HNO₃</u> | <u>1</u> | <u>LLHg</u> | | |
| | | | | |
| | | | | |

Suspended Solids Samples

Filtration Start Date:

11/13/09

Filter Bags Collected:

1

Filtration End Date:

01/08/10

Filter Bag #:

FB-041

Total Volume Filtered:

2568

Initial Dry Weight:

99.93g

* 11/23/09 - Flowmeter crushed + broken; read 857.3 gal
Replaced w/ working flowmeter - initial flow 6414.4 gal

** 11/13/09 - suspect pH meter not functioning

01/08/2010 - Final Flowmeter 8211.8 gal

Final rainfall: 6x25mm + 24.4mm

Source Control Sample Collection Form

Boeing Plant 2, Seattle/Tukwila, Washington

Stormwater Line: J

Sample Type: ☒ Suspended Solids/Whole Water
☐ Whole Water Only

Initial Flowmeter Reading: FB-038 / FB-004
8217.8 g / 53444.6 g LS

Final Flowmeter Reading: 12507.3 g / 58082 g
 Total Rainfall: 3.36 in / 0.33 in

Weather/Field Conditions: 1/12/2010 - Sporadic rain, warm
2/3/2010 - Sporadic rain
3/9/2010 - overcast, cold
4/22/2010 - Clear

Station: 18-505A

Suspended Solids Sample ID: PL2SC-W-J505A-020310

Water Sample ID: LS, JL, TN

Field Team (Initials): LS, JL, TN

Sampling Start Date: 1/12/2010*

Sampling End Date: 4/22/2010

PL2SC-SS-18-505A-041310
PL2SC-SS-18-J505A-042210

Water Sampling Information

Water Sampling Date: 2/3/2010

Water Sampling Time: 1530

Gallons Pumped: 1829.3

Sample Collection Method (Check One)

Submersible Pump ☒

Peristaltic Pump ☐

Pole-Mounted Bottle Dipper (water only) ☐

Hand (water only) ☐

Other ☐

| Date | Time | Turbidity (NTU) | pH | Temp (°C) | Cond (µS/cm OR mS/cm) | Appearance |
|----------|------|-----------------|------|-----------|-----------------------|------------|
| 2/3/2010 | 1525 | 2.31 | 6.01 | 11.4 | 18.3 | clear |

Water Samples

Sample Collection Time: 1530

Number of Bottles: 1

| Bottle Type/Preservative | Number Filled | Analysis | Field Filtered (Y/N) | Comments |
|---|---------------|------------|----------------------|----------|
| 1L poly/HNO3 | 1 | SMS Metals | Y | |
| 500mL poly/HNO3 | 1 | LLHg | Y | |
| 500mL poly/None | 1 | pH | N | |
| ↳ collected extra volume for lab pH, suspected pH meter may be malfunctioning | | | | |

Suspended Solids Samples

FB-038 FB-004

Filtration Start Date: 1/12/2010 and 4/14/2010

Filtration End Date: 3/9/2010 and 4/22/2010

Total Volume Filtered: 4289.6 g and 4637.4 gal

Filter Bags Collected: 3*

Filter Bag #: FB-038/FB-007/FB-004

Initial Dry Weight: 100.62g / 97.73g / 100.70g

* Sampler (#1) initially set up on 1/12/2010. Sandbags placed in basin to create reservoir to trigger pump.

2/19/2010 - Upon inspection, discovered grey film coating filter bag.

3/9/2010 - Collected PL2SS-J505A-030910 and submitted for analysis along w/ a sample of bentonite chips:

PL2SC-BE1-030910

Final flow: 12507.3 gal

Removed all sandbags.

Rain: 85.4mm = 3.36 in

3/22/2010 - Contractor (Bravo) performed confined space entry to construct brick and mortar dam.

3/26/2010 - Decontaminated sampler #1 and re-set. FB-007 Init. Flow = 12507 gal

3/29/2010 - Flow totalizer not moving, water flushing through

4/19/2010 - Replaced flow totalizer w/ working instrument. Handle of sample housing smashed, could not open.

4/19/2010 - Decont. new housing (#3), collected PL2SC-SS-18-505A-041310 and submitted on hold. Placed new filter bag (FB-004). Init. Flow = 53444.6 gal

4/22/2010 - Collected PL2SC-SS-J505A-042210

TFlow = 58082 gal

TRain = 8.4mm = 0.33 in.

Source Control Sample Collection Form

Boeing Plant 2, Seattle/Tukwila, Washington

| | | | | | |
|----------------------------|---|-----------------|---|--|---|
| Stormwater Line: | <div style="border: 1px solid black; padding: 2px; text-align: center;">V</div> | | Station: | <div style="border: 1px solid black; padding: 2px;">2-44 Gate Valve</div> | |
| Sample Type: | <input type="checkbox"/> Suspended Solids/Whole Water <input checked="" type="checkbox"/> Whole Water Only | | Suspended Solids Sample ID: | <div style="border: 1px solid black; padding: 2px;">N/A</div> | |
| Initial Flowmeter Reading: | <div style="border: 1px solid black; padding: 2px;">N/A</div> | | Water Sample ID: | <div style="border: 1px solid black; padding: 2px;">PL2SC-W-V-110909</div> | |
| Final Flowmeter Reading: | <div style="border: 1px solid black; padding: 2px;">N/A</div> | Total Rainfall: | <div style="border: 1px solid black; padding: 2px;">N/A</div> | Field Team (Initials): | <div style="border: 1px solid black; padding: 2px;">LS JL</div> |
| Weather/Field Conditions: | <div style="border: 1px solid black; padding: 2px; text-align: center;">rain</div> | | Sampling Start Date: | <div style="border: 1px solid black; padding: 2px;">11/9/09</div> | |
| | | | Sampling End Date: | <div style="border: 1px solid black; padding: 2px;">N/A</div> | |

Water Sampling Information

Water Sampling Date:

11/09/09

 Water Sampling Time:

12:35 / 12:37 (dup)

 Gallons Pumped:

N/A

Sample Collection Method (Check One)

- Submersible Pump ☐
 Peristaltic Pump ☒
 Pole-Mounted Bottle Dipper (water only) ☐
 Hand (water only) ☐
 Other ☐

| Date | Time | Turbidity (NTU) | pH | Temp (°C) | Cond (µS/cm OR mS/cm) | Appearance |
|---------|------|-----------------|------|-----------|-----------------------|------------|
| 11/9/09 | 1232 | 5.40 | 7.47 | 9.6 | 623 | clear |

Water Samples

Sample Collection Time:

12:35 and 12:37 (dup)

 Number of Bottles:

4

| Bottle Type/Preservative | Number Filled | Analysis | Field Filtered (Y/N) | Comments |
|--------------------------|---------------|--------------|----------------------|----------|
| 1L poly / HNO3 | 2 | Diss SMS Mat | Y | |
| 500mL poly / HNO3 | 2 | 1L-Hg (diss) | Y | |
| | | | | |
| | | | | |

Suspended Solids Samples

Filtration Start Date: _____

Filter Bags Collected: _____

Filtration End Date: _____

Filter Bag #: _____

Total Volume Filtered: _____

Initial Dry Weight: _____

Duplicate sample collected at 12:37
 PL2SC-W-DUP-110909

Source Control Sample Collection Form

Boeing Plant 2, Seattle/Tukwila, Washington

| | | | | |
|----------------------------|--|--|-----------------------------|--------------------------|
| Stormwater Line: | <u>Z</u> | | Station: | <u>36-131</u> |
| Sample Type: | <input checked="" type="checkbox"/> Suspended Solids/Whole Water <input type="checkbox"/> Whole Water Only | | Suspended Solids Sample ID: | <u>PL2SC-SS-Z-030310</u> |
| | | | Water Sample ID: | <u>PL2SC-W-Z-022610</u> |
| Initial Flowmeter Reading: | <u>61.1 gal</u> | | Field Team (Initials): | <u>LS, JL</u> |
| Final Flowmeter Reading: | <u>9598.4 gal</u> | Total Rainfall: <u>136.8 mm = 5.4 in</u> | Sampling Start Date: | <u>01/08/2010</u> |
| Weather/Field Conditions: | <u>1/8/2010 - Light rain</u> <u>2/26/10 - overcast, sporadic rain, warm</u> <u>03/03/2010 - overcast, mild</u> | | Sampling End Date: | <u>03/03/2010</u> |

Water Sampling Information

Water Sampling Date: 2/26/10
 Water Sampling Time: 9:05
 Gallons Pumped: 7271

Sample Collection Method (Check One)

Submersible Pump ☒
 Peristaltic Pump ☐
 Pole-Mounted Bottle Dipper (water only) ☐
 Hand (water only) ☐
 Other ☐

| Date | Time | Turbidity (NTU) | pH | Temp (°C) | Cond (µS/cm) OR mS/cm | Appearance |
|----------------|-------------|-----------------|------------|------------|-----------------------|--------------|
| <u>2/26/10</u> | <u>9:00</u> | <u>8.07</u> | <u>Lab</u> | <u>9.9</u> | <u>270</u> | <u>clear</u> |

Water Samples

Sample Collection Time: 9:05
 Number of Bottles: 3

| Bottle Type/Preservative | Number Filled | Analysis | Field Filtered (Y/N) | Comments |
|--------------------------|---------------|-------------------|----------------------|----------|
| <u>1L Poly / HNO3</u> | <u>1</u> | <u>SMS metals</u> | <u>Y</u> | |
| <u>500mL Poly / HNO3</u> | <u>1</u> | <u>LL Hg</u> | <u>Y</u> | |
| <u>500mL Poly / None</u> | <u>1</u> | <u>pH</u> | <u>N</u> | |
| | | | | |
| | | | | |

Suspended Solids Samples

Filtration Start Date: 1/8/2010 # Filter Bags Collected: 1
 Filtration End Date: 2/3/2010 Filter Bag #: FA-040
 Total Volume Filtered: 9537.3 gal Initial Dry Weight: 99.04g

ATTACHMENT B
LABORATORY ANALYTICAL DATA
PROVIDED ON CD

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**Table B-1
Source Control Sample List**

**Stormwater Source Control Round 4 Sampling Report
Boeing Plant 2**

| Stormwater Line | Sampling Location | Sample Name | Sample Type | Analytes | ARI Sample Delivery Group |
|-----------------|-------------------|----------------------|--|---------------------------|---------------------------|
| Line A | 2-371 | PL2SC-SS-A-040210 | Suspended Solids | Metals | QR17 |
| Line A | 2-371 | PL2SC-W-A-032910 | Water, Field Filtered (filter bag plus 0.45 um field filter) | Dissolved Metals, pH | QQ28/QQ32 |
| Line B | 3-307 | PL2SC-SS-B-040710 | Suspended Solids | PCBs and Metals | QR83 |
| Line B | 3-307 | PL2SC-W-B-021210 | Water, Field Filtered (filter bag plus 0.45 um field filter) | Dissolved Metals, pH | QJ96/QJ98 |
| Line G | Outfall G | PL2SC-W-G-110909 | Water | SVOCs | PW88 |
| Line I | 4-283 | PL2SC-SS-I-020510 | Suspended Solids | PCBs and Metals | QI75 |
| Line J | 18-249 | PL2SC-SS-J249-010810 | Suspended Solids | PCBs and Metals | QE75 |
| Line J | 18-249 | PL2SC-W-J249-111309 | Water, Field Filtered (filter bag plus 0.45 um field filter) | Dissolved Metals | PX46/PX47 |
| Line J | 18-505A | PL2SC-SS-J505-030910 | Suspended Solids | PCBs and Metals | QO78 |
| Line J | 18-505A | PL2SC-SS-J505-042210 | Suspended Solids | PCBs and Metals | QT80 |
| Line J | 18-505A | PL2SC-W-J505A-020310 | Water, Field Filtered (filter bag plus 0.45 um field filter) | Dissolved Metals, pH | QI23/QI24 |
| Line V | 2-44 Gate Valve | PL2SC-W-DUP-110909 | Water, Field Filtered (0.45 um field filter) | Dissolved Metals | PW88/PW89 |
| Line V | 2-44 Gate Valve | PL2SC-W-V-110909 | Water, Field Filtered (0.45 um field filter) | Dissolved Metals | PW88/PW89 |
| Line Z | 36-131 | PL2SC-SS-Z-03032010 | Suspended Solids | PCBs and Metals | QM32 |
| Line Z | 36-131 | PL2SC-W-Z-022610 | Water, Field Filtered (0.45 um field filter) | Dissolved Metals, pH | QL59/QL62 |
| -- | -- | PL2SC-EB1-111209 | Equipment Blank, Sampler #1 | PCBs and Dissolved Metals | PX30/PX33 |
| -- | -- | PL2SC-EB1-011210 | Equipment Blank, Sampler #1 | PCBs and Dissolved Metals | QF18/QF21 |
| -- | -- | PL2SC-EB1-032610 | Equipment Blank, Sampler #1 | PCBs and Dissolved Metals | QQ02/QQ03 |
| -- | -- | PL2SC-EB2-121809 | Equipment Blank, Sampler #2 | PCBs and Dissolved Metals | QC17/QC18 |
| -- | -- | PL2SC-EB2-030310 | Equipment Blank, Sampler #2 | PCBs and Dissolved Metals | QM43/QM45 |
| -- | -- | PL2SC-W-EB3-112309 | Equipment Blank, Sampler #3 | PCBs and Dissolved Metals | PY96/PY97 |
| -- | -- | PL2SC-EB3-020510 | Equipment Blank, Sampler #3 | PCBs and Dissolved Metals | QI78/QI90 |
| -- | -- | PL2SC-EB3-041310 | Equipment Blank, Sampler #3 | PCBs and Dissolved Metals | QS55/QS56 |

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ANALYTICAL
RESOURCES
INCORPORATED

ANALYST NOTES - Organic Extractions

ARI Job No: N/A

Client Name: The Boeing Company

Parameter: Filter Weights

Client Project: N/A

N/A

SOP Number(s)

☐ No Anomalies

List problems, corrective actions, and any other pertinent information:

| | | | |
|--------|---|-----------------------|--|
| FB-020 | - | 101.66g (as received) | - After air drying = 101.63g |
| FB-024 | - | 100.45g | |
| FB-025 | - | 100.12g | |
| FB-022 | - | 99.83g | |
| FB-019 | - | 100.37g | |
| FB-046 | - | 101.35g | |
| FB-045 | - | 103.80g | |
| FB-044 | - | 102.44g | Piece of dry Lat removed - Brown Paint flake removed |
| FB-043 | - | 101.70g | |
| FB-042 | - | 103.29g | |
| FB-041 | - | 99.93g | |
| FB-040 | - | 99.04g | |
| FB-039 | - | 102.18g | |
| FB-038 | - | 100.62g | |
| FB-037 | - | 101.04g | |
| FB-036 | - | 99.97g | |
| FB-035 | - | 102.37g | |
| 034 | - | 102.06g | |
| 033 | - | 96.21g | |
| 032 | - | 103.92g | |
| 031 | - | 97.97g | |
| 030 | - | 100.26g | |
| 029 | - | 102.56g | |
| 018 | - | 99.72g | |
| 017 | - | 100.40g | |
| 016 | - | 99.33g | |

Extraction

Analyst: _____

Date Extracted: _____

See Reverse Side for Additional Information



ANALYTICAL
RESOURCES
INCORPORATED

ANALYST NOTES - Organic Extractions

ARI Job No: _____

Client Name: _____

Parameter: _____

Client Project: _____

SOP Number(s)

No Anomalies

List problems, corrective actions, and any other pertinent information:

FB-027 - 100.61g ^{WV 12.22} (100.61g)
026 - 100.00g
028 - 99.65g
023 - 101.72g
021 - 101.22g
001 - 101.28g
006 - 101.88g
005 - 100.49g
004 - 100.70g
009 - 103.75g
010 - 97.11g
~~002~~ ^{WV 12.26} 97.73g
002 - 99.12g
008 - 99.08g
003 - 100.20g
014 - 101.22g
013 - 99.90g
012 - 100.05g
011 - 100.71g
015 - 98.85g

Extraction

Analyst: _____

Date Extracted: _____

See Reverse Side for Additional Information



Analytical Resources, Incorporated
Analytical Chemists and Consultants

November 23, 2009

Will Ernst
The Boeing Company
Energy and Environmental Affairs
P.O. Box 3707, M/S 7A-WH
Seattle, WA 98124-2207

RE: Boeing Plant 2 Source Control
ARI ID: PW88 & PW89

Dear Will:

Please find enclosed the original *Chain of Custody* (COC) record and final data package for the project referenced above.

Sample receipt information and analytical details are addressed in the *Case Narrative*.

Copies of the reports and all associated raw data will be kept on file at ARI. If you have any questions or require additional information, please contact me at your convenience.

Sincerely,
ANALYTICAL RESOURCES, INC.

Kelly Bottem
Client Services Manager
(206) 695-6211
kellyb@arilabs.com

KB/kb

Enclosures

cc: Kent Angelos, Golder Associates Inc., 18300 NE Union Hill Road, Suite 200, Redmond,
WA 98052-3333

Chain of Custody
Documentation

prepared
for

The Boeing Company

Project: Plant 2 Source Control, 013-1646-009.500

ARI JOB NO: PW88, PW89

prepared
by

Analytical Resources, Inc.

Analytical Resources, Incorporated
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)

| | |
|-------------------|--|
| Page: 1 | of 1 |
| Date: 11/19/2007 | Ice Present? <input checked="" type="checkbox"/> |
| No. of Coolers: 1 | Cooler Temps: 6.1 |

| | | | |
|----------------------|------------------------|------------------------|--------------------|
| ARI Assigned Number: | PW39 | Turn-around Requested: | Standard |
| ARI Client Company: | Boeing | Phone: | - |
| Client Contact: | Will Ernst | | |
| Client Project Name: | Plant 2 Source Control | | |
| Client Project #: | 013-1646-009.500 | Samplers: | L-Shea J. Lamberts |

| Sample ID | Date | Time | Matrix | No. Containers |
|-------------------------------|---|------|--------|--|
| PL2SC-4-291BINS-110909 | 11/09/09 | 0735 | Solids | 1 |
| PL2SC-37-70INS-110909 | 11/09/09 | 0757 | Solids | 1 |
| PL2SC-EB-110909 | 11/09/09 | 1020 | DI | 2 |
| PL2SC-W-V-110909 | 11/09/09 | 1235 | W | 2 |
| PL2SC-W-DUP-110909 | 11/09/09 | 1237 | W | 2 |
| PL2SC-W-G-110909 | 11/09/09 | 1324 | W | 4 |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| Comments/Special Instructions | Relinquished by: (Signature) <i>E. Sheehan</i> | | | Received by: (Signature) <i>[Signature]</i> |
| Please cc. D. Machut | Printed Name: <i>Liz Sheehan</i> | | | Printed Name: <i>Jone H</i> |
| L. Shea. | Company: <i>Golder</i> | | | Company: <i>ARI</i> |
| | Date & Time: <i>11/9/09 1353</i> | | | Date & Time: <i>11/9/10</i> |

Limits of Liability: ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, notwithstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.



Analytical Resources,
Incorporated
Analytical Chemists and
Consultants

Cooler Receipt Form

ARI Client: Boeing

Project Name: Plant 2 Source Control

COC No(s): _____ (NA)

Delivered by: Fed-Ex UPS Courier Hand Delivered Other: _____

Assigned ARI Job No: FW89

Tracking No: _____ (NA)

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to cooler? _____

YES

(NO)

Were custody papers included with the cooler? _____

(YES)

NO

Were custody papers properly filled out (ink, signed, etc.) _____

(YES)

NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry)..... 6.1

If cooler temperature is out of compliance fill out form 00070F

Temp Gun ID#: 70941619

Cooler Accepted by: JW

Date: 11/9/09

Time: 1353

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler? _____

YES

(NO)

What kind of packing material was used? ... Bubble Wrap Wet Ice Gel Packs Baggies Foam Block Paper Other: _____

Was sufficient ice used (if appropriate)? _____

NA

YES

(NO)

Were all bottles sealed in individual plastic bags? _____

(YES)

NO

Did all bottles arrive in good condition (unbroken)? _____

(YES)

NO

Were all bottle labels complete and legible? _____

(YES)

NO

Did the number of containers listed on COC match with the number of containers received? _____

(YES)

NO

Did all bottle labels and tags agree with custody papers? _____

(YES)

NO

Were all bottles used correct for the requested analyses? _____

(YES)

NO

Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)...

NA

(YES)

NO

Were all VOC vials free of air bubbles? _____

(NA)

YES

NO

Was sufficient amount of sample sent in each bottle? _____

(YES)

NO

Samples Logged by: JP

Date: 11/9/09

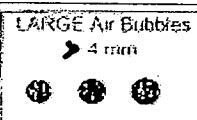
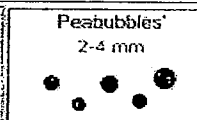
Time: 1645

**** Notify Project Manager of discrepancies or concerns ****

| Sample ID on Bottle | Sample ID on COC | Sample ID on Bottle | Sample ID on COC |
|---------------------|------------------|---------------------|------------------|
| | | | |
| | | | |
| | | | |
| | | | |

Additional Notes, Discrepancies, & Resolutions:

By: _____ Date: _____



Small → "sm"

Peabubbles → "pb"

Large → "lg"

Headspace → "hs"

Cooler Temperature Compliance Form

[illegible]

PRESERVATION VERIFICATION 11/09/09

Page 1 of 1

Inquiry Number: NONE
 Analysis Requested: 11/09/09
 Contact: Ernst, Will
 Client: The Boeing Company
 Logged by: JP
 Sample Set Used: Yes-494
 Validatable Package: No
 Deliverables:



ARI Job No: PW89

PC: Kelly
 VTSR: 11/09/09

Project #: 013-1646-009.500
 Project: Plant 2 Source Control
 Sample Site:
 SDG No:
 Analytical Protocol: In-house

| LOGNUM | CLIENT ID | CN | WAD | NH3 | COD | POG | MET | PHEN | PHOS | TKN | NO23 | TOC | S2 | AK102 | Fe2+ | DMET | DOC | FLT | FLT | PARAMETER | ADJUSTED | LOT | AMOUNT | DATE/BY |
|----------|--------------------|----|-----|-----|-----|-----|------|------|------|-----|------|-----|----|-------|------|------|-----|-----|-----|-----------|----------|-----|--------|---------|
| ARI ID | | | | | | | | | | | | | | | | | | | | | | | | |
| 09-27529 | PL2SC-W-V-110909 | | | | | | DIS | | | | | | | | | | | | | | | | | |
| PW89D | | | | | | | PASS | | | | | | | | | | | | | | | | | |
| 09-27530 | PL2SC-W-DUP-110909 | | | | | | DIS | | | | | | | | | | | | | | | | | |
| PW89E | | | | | | | PASS | | | | | | | | | | | | | | | | | |

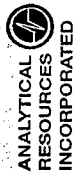
Checked By JP Date 11/9/09

| | |
|-------------------|--|
| Page: 1 | of 1 |
| Date: 11/9/2007 | Ice Present? <input checked="" type="checkbox"/> |
| No. of Coolers: 1 | Cooler Temps: 6.1 |

| | |
|-------------------|--|
| Page: 1 | of 1 |
| Date: 11/9/2007 | Ice Present? <input checked="" type="checkbox"/> |
| No. of Coolers: 1 | Cooler Temps: 6.1 |

[illegible]

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.



ARI Job No: PW88

PC: Kelly
VTSR: 11/09/09

Inquiry Number: NONE
Analysis Requested: 11/09/09
Contact: Ernst, Will
Client: The Boeing Company
Logged by: JP
Sample Set Used: Yes-481
Validatable Package: No
Deliverables:

Project #: 013-1646-009.500
Project: Plant 2 Source Control
Sample Site:
SDG No:
Analytical Protocol: In-house

| LOGNUM | CLIENT ID | CN | WAD | NH3 | COD | FOG | MET | PHEN | PHOS | TKN | NO23 | TOC | S2 | AK102 | Fe2+ | DMET DOC | FLT | FLT | PARAMETER | ADJUSTED TO | LOT NUMBER | AMOUNT ADDED | DATE/BY |
|-------------------|--------------------|----|-----|-----|-----|-----|-------------|------|------|-----|------|-----|----|-------|------|----------|-----|-----|-----------|-------------|------------|--------------|---------|
| 09-27524 PW88A | PL2SC-W-V-110909 | | | | | | DIS PASS | | | | | | | | | | Y | | | | | | |
| 09-27525 PW88B | PL2SC-W-DUP-110909 | | | | | | DIS PASS | | | | | | | | | | Y | | | | | | |

Checked By JP Date 11/9/09



Analytical Resources,
Incorporated
Analytical Chemists and
Consultants

Cooler Receipt Form

ARI Client: Boeing

COC No(s): _____ (NA)

Assigned ARI Job No: PW88

Project Name: Plant 2 Source Control

Delivered by: Fed-Ex UPS Courier Hand Delivered Other: _____

Tracking No: _____ (NA)

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of cooler? _____

YES

(NO)

Were custody papers included with the cooler? _____

(YES)

NO

Were custody papers properly filled out (ink, signed, etc.) _____

(YES)

NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry) _____ 6.1

If cooler temperature is out of compliance fill out form 00070F

Temp Gun ID#: 90941619

Cooler Accepted by: JW Date: 11/9/09 Time: 1353

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler? _____

YES

(NO)

What kind of packing material was used? ... Bubble Wrap (Wet Ice) Gel Packs Baggies Foam Block Paper Other: _____

Was sufficient ice used (if appropriate)? _____

NA

YES

(NO)

Were all bottles sealed in individual plastic bags? _____

(YES)

NO

Did all bottles arrive in good condition (unbroken)? _____

(YES)

NO

Were all bottle labels complete and legible? _____

(YES)

NO

Did the number of containers listed on COC match with the number of containers received? _____

(YES)

NO

Did all bottle labels and tags agree with custody papers? _____

(YES)

NO

Were all bottles used correct for the requested analyses? _____

(YES)

NO

Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)...

NA

(YES)

NO

Were all VOC vials free of air bubbles? _____

(NA)

YES

NO

Was sufficient amount of sample sent in each bottle? _____

(YES)

NO

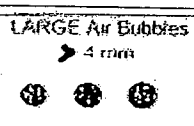
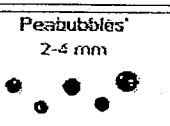
Samples Logged by: JP Date: 11/9/09 Time: 11025

**** Notify Project Manager of discrepancies or concerns ****

| Sample ID on Bottle | Sample ID on COC | Sample ID on Bottle | Sample ID on COC |
|---------------------|------------------|---------------------|------------------|
| | | | |
| | | | |
| | | | |
| | | | |

Additional Notes, Discrepancies, & Resolutions:

By: _____ Date: _____

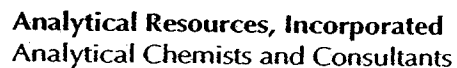


Small → "sm"

Peabubbles → "pb"

Large → "lg"

Headspace → "hs"



Cooler Temperature Compliance Form

0070F

Case Narrative

prepared
for

The Boeing Company

Project: Plant 2 Source Control, 013-1646-009.500

ARI JOB NO: PW88, PW89

prepared
by

Analytical Resources, Inc.



Case Narrative

Project: Boeing Plant 2 Source Control

ARI IDs: PW88 & PW89

Matrix: Water

Date: November 23, 2009

Sample Receipt Information

Two solid samples and four water samples were received in good condition at Analytical Resources, Inc. (ARI) on November 9, 2009 under ARI sample delivery groups (SDGs) PW88 and PW89. The cooler temperature, as measured by IR thermometer, was 6.1°C. For further details regarding sample receipt, please refer to the enclosed Cooler Receipt Form and Preservation Verification sheet.

The samples were analyzed for the parameters listed below, as requested on the Chain of Custody.

Semivolatiles by Method 8270D:

The sample was extracted on 11/11/09 and analyzed on 11/16/09 within the method recommended holding times.

Initial calibration (s): All analytes of interest were within method acceptance criteria.

Continuing calibration (s): The percent difference (%D) for compounds 2,2 -oxybis(1-Chloropropane) and Butylbenzylphthalate were out of QC limits at a high bias. The sample was non-detect for these compounds and Q flags have been applied. The %D for compounds Hexachlorobutadiene, 2,4-Dinitrophenol and Hexachlorocyclopentadiene were out of QC limits at a low bias and Q flags have been applied to the data.

Samples: There were no anomalies associated with these samples.

Surrogates: The surrogate percent recoveries were within control limits.

LCS/LCSD(s): Several compounds were of QC limits at a low bias on the LCS and LCSD due to sporadic failure. No corrective action was taken.

Method Blank: The method blank was free of contamination.

SIM PNAs by Method 8270D SIM:

The sample was extracted on 11/11/09 and analyzed on 11/16/09 within the method recommended holding times.

Initial calibration (s): All analytes of interest were within method acceptance criteria.

Continuing calibration (s): Are in control.



Case Narrative

Project: Boeing Plant 2 Source Control

ARI IDs: PW88 & PW89

Matrix: Water

Date: November 23, 2009

Samples: There were no anomalies associated with these samples.

Surrogates: The surrogate percent recoveries were within control limits.

LCS/LCSD(s): Benzo(a) pyrene was low in the LCSD at 21.7%. The LCS was acceptable and no corrective action was taken.

Method Blank: The method blank was free of contamination.

PCBs by Method 8082:

The solid samples were extracted on 11/16/09 and analyzed between 11/18/09 and 11/19/09 within the method recommended holding times. The water sample was extracted on 11/11/09 and analyzed on 11/17/09.

Initial calibration (s): All analytes of interest were within method acceptance criteria.

Continuing calibration (s): The internal standard Bromo-Nitrobenzene and was out of control in two of the 1660 continuing calibrations and Hexabromobiphenyl was out in one CC on one column on the 11/18/09 run of ECD7. This affects the 1016 quant only. The second column was within compliance.

Samples: There were no anomalies associated with these samples.

Surrogates: All surrogate recoveries were in control.

LCS(s): All percent recoveries for the analytes of interest were within compliance.

Method Blank: The method blank was free of contamination.

Dissolved Metals by Methods 6010B and 7000 series

The samples were digested on 11/11/09. The digests were analyzed between 11/17/09 and 11/18/09 within the method recommended holding times.

Replicate(s): All percent recoveries were within compliance.

Samples: No anomalies were encountered for these samples.

LCS/Blank Spike(s): All percent recoveries were within compliance.



Case Narrative

Project: Boeing Plant 2 Source Control
ARI IDs: PW88 & PW89
Matrix: Water
Date: November 23, 2009

Method Blank(s): Are in control.

Dissolved Low-Level Mercury by Method SW7470A

The samples were digested on 11/11/09. The digests were analyzed on 11/12/09 within the method recommended holding times.

Replicate(s): All percent recoveries were within compliance.

Samples: No anomalies were encountered for these samples.

LCS/Blank Spike(s): All percent recoveries were within compliance.

Method Blank(s): Are in control.



Data Reporting Qualifiers

Effective 7/10/2009

Inorganic Data

- U Indicates that the target analyte was not detected at the reported concentration
- * Duplicate RPD is not within established control limits
- B Reported value is less than the CRDL but \geq the Reporting Limit
- N Matrix Spike recovery not within established control limits
- NA Not Applicable, analyte not spiked
- H The natural concentration of the spiked element is so much greater than the concentration spiked that an accurate determination of spike recovery is not possible
- L Analyte concentration is ≤ 5 times the Reporting Limit and the replicate control limit defaults to ± 1 RL instead of the normal 20% RPD

Organic Data

- U Indicates that the target analyte was not detected at the reported concentration
- * Flagged value is not within established control limits
- B Analyte detected in an associated Method Blank at a concentration greater than one-half of ARI's Reporting Limit or 5% of the regulatory limit or 5% of the analyte concentration in the sample.
- J Estimated concentration when the value is less than ARI's established reporting limits
- D The spiked compound was not detected due to sample extract dilution
- E Estimated concentration calculated for an analyte response above the valid instrument calibration range. A dilution is required to obtain an accurate quantification of the analyte.
- Q Indicates a detected analyte with an initial or continuing calibration that does not meet established acceptance criteria ($< 20\%$ RSD, $< 20\%$ Drift or minimum RRF).
- S Indicates an analyte response that has saturated the detector. The calculated concentration is not valid; a dilution is required to obtain valid quantification of the analyte



- NA The flagged analyte was not analyzed for
- NR Spiked compound recovery is not reported due to chromatographic interference
- NS The flagged analyte was not spiked into the sample
- M Estimated value for an analyte detected and confirmed by an analyst but with low spectral match parameters. This flag is used only for GC-MS analyses
- M2 The sample contains PCB congeners that do not match any standard Aroclor pattern. The PCBs are identified and quantified as the Aroclor whose pattern most closely matches that of the sample. The reported value is an estimate.
- N The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification"
- Y The analyte is not detected at or above the reported concentration. The reporting limit is raised due to chromatographic interference. The Y flag is equivalent to the U flag with a raised reporting limit.
- C The analyte was positively identified on only one of two chromatographic columns. Chromatographic interference prevented a positive identification on the second column
- P The analyte was detected on both chromatographic columns but the quantified values differ by $\geq 40\%$ RPD with no obvious chromatographic interference

Geotechnical Data

- A The total of all fines fractions. This flag is used to report total fines when only sieve analysis is requested and balances total grain size with sample weight.
- F Samples were frozen prior to particle size determination
- SM Sample matrix was not appropriate for the requested analysis. This normally refers to samples contaminated with an organic product that interferes with the sieving process and/or moisture content, porosity and saturation calculations
- SS Sample did not contain the proportion of "fines" required to perform the pipette portion of the grain size analysis
- W Weight of sample in some pipette aliquots was below the level required for accurate weighting

LCS SOLUTIONS

11/06/2009

| LABL | SOLN ID | TEST | CONC. UG/ML | SOLVENT | EXP. |
|------|---------|--------------|-------------|---------|----------|
| 1 | 1667-4 | PCB | 20 | ACETONE | 10/29/10 |
| 2# | 1472-3 | BCOC PEST | 10 | ACETONE | NA |
| 3 | 1620-4 | PEST | 02/04/20 | ACETONE | 06/26/10 |
| 4 | 1667-1 | LOW PEST | 0.2/0.4/2 | ACETONE | 06/26/10 |
| 5 | 1580-2 | EPH | 1500 | MECL2 | 01/29/10 |
| 6 | 1655-3 | PCP | 12.5/125 | ACETONE | 09/24/10 |
| 7 | 1635-1 | ABN | 100 | ACETONE | 02/01/10 |
| 8 | 1566-1 | TBT | 2.5 | MECL2 | 12/04/09 |
| 9 | 1567-3 | PORE TBT | .125/.25 | MECL2 | 12/04/09 |
| 10 | 1621-4 | ABN ACID | 100/200 | MEOH | 07/14/10 |
| 11 | 1642-2 | TPHD | 15000 | ACETONE | 09/07/10 |
| 12 | 1622-2 | ABN BASE | 200 | ACETONE | 02/05/10 |
| 13 | 1613-1 | LOW PCB | 2 | ACETONE | 06/08/10 |
| 14* | 1547-1 | LOW ABN ACID | 10/20 | MEOH | 04/10/10 |
| 15* | 1591-3 | SIM PNA | 15/75 | MEOH | 08/28/10 |
| 16 | 1602-3 | DIOXANE | 100 | MEOH | 03/20/10 |
| 17 | 1644-1 | 1248 PCB | 10 | ACETONE | 09/10/10 |
| 18* | 1591-4 | LOW SIM PNA | 1.5 | ACETONE | 08/28/10 |
| 19 | 1574-4 | AK103 | 7500 | MECL2 | 12/02/09 |
| 20 | 1572-2 | PNA | 100 | ACETONE | 12/26/09 |
| 21 | 1593-3 | SKY/BHT | 100 | MEOH | 03/31/10 |
| 22 | 1631-1 | HERB | 12.5/12500 | MEOH | 02/19/10 |
| 23* | 1505-1 | LW ABN BASE | 20 | MEOH | 03/20/10 |
| 24 | 1613-2 | LOW ABN | 10 | ACETONE | 02/28/10 |
| 25# | 1481-1 | DIPHENYL | 100 | MEOH | NA |
| 26* | 1545-2 | OP-PEST | 25 | MEOH | 02/16/10 |
| 27 | 1668-3 | STEROLS | 200 | MEOH | 10/30/10 |
| 28# | 1595-1 | ADD. PEST | 4 | ACETONE | NA |
| 29# | 1496-3 | DECANES | 100 | MEOH | NA |
| 30 | 1620-1 | EDB/DBCP | 0.2 | MEOH | 06/22/10 |
| 31 | 1596-1 | TERPINEOL | 100 | MEOH | 04/03/10 |

LCS SOLUTIONS

11/06/2009

| | | | | | |
|----|--------|-----------------------------|--------|---------|----------|
| 32 | 1619-3 | GUAIACOL | 50-200 | ACETONE | 04/30/10 |
| 33 | 1639-3 | RETENE | 100 | MEOH | 09/03/10 |
| 34 | 1633-1 | CONGENERS | 2.5 | ACETONE | 08/11/10 |
| 35 | 1601-2 | ALKYL PNA A | 10 | MEOH | 04/03/10 |
| 36 | 1601-3 | ALKYL PNA B | 10 | MEOH | 05/13/10 |
| 50 | 1617-1 | FULL RESIN | 250 | ACETONE | 06/17/10 |
| 51 | 1611-3 | DDTS | 2.5 | ACETONE | 06/04/10 |
| 52 | 1613-5 | 1232 PCB | 20 | ACETONE | 06/16/10 |
| | | | | | |
| | | *=REVERIFIED SOLUTION | | | |
| | | #=PROJECT SPECIFIC SOLUTION | | | |
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SURR SOLUTIONS

11/06/2009

| LABEL | SOLN ID | TEST | CONC. UG/ML | SOLVENT | EXP. |
|----------------------|---------|------------|-------------|---------|----------|
| A | 1662-3 | ABN | 100/150 | MEOH | 10/08/10 |
| B | 1633-3 | SIM PNA | 15/75 | MEOH | 08/12/10 |
| C* | 1559-1 | SIM ABN | 25/37.5 | MEOH | 03/13/10 |
| D | 1635-2 | LOW PCB | 0.2 | ACETONE | 05/29/10 |
| E | 1661-2 | HERB | 62.5 | MEOH | 10/02/10 |
| F | 1574-3 | PCP | 12.5 | ACETONE | 01/06/10 |
| G* | 1534-1 | 1,4DIOXANE | 100 | MEOH | 02/20/10 |
| H | 1594-1 | OP-PEST | 25 | MEOH | 04/01/10 |
| I | 1634-1 | LOW S. PNA | 1.5 | MEOH | 08/12/10 |
| J | 1566-5 | TBT-PORE | 0.125 | MECL2 | 12/04/09 |
| K | 1612-1 | MED PCB | 20 | ACETONE | 05/29/10 |
| L | 1584-4 | TBT | 2.5 | MECL2 | 12/04/09 |
| M | 1578-1 | EPH | 1500 | MECL2 | 12/09/09 |
| N | 1612-2 | PCB | 2 | ACETONE | 05/29/10 |
| O | 1647-2 | TPH | 450 | MECL2 | 07/02/10 |
| P | 1666-3 | HCID | 2250 | MECL2 | 05/06/10 |
| Q | 1620-2 | EDB | 1 | MEOH | 06/22/10 |
| R | 1615-1 | RESIN ACID | 250 | ACETONE | 06/17/10 |
| S | 1568-5 | PBDE | .25 | MEOH | 12/11/09 |
| T | 1601-1 | ALKYL PNA | 10 | MEOH | 11/26/09 |
| U | 1633-1 | CONGENER | 2.5 | ACETONE | 08/11/10 |
| V | | | | | |
| *reverified solution | | | | | |
| X | | | | | |
| Y | | | | | |
| Z | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
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MDL and RL Summary GC-MS – SVOA Analysis of Water EPA Method 8270D

MDL's and reporting are updated periodically. Assure you are using ARI's current detection limits by downloading the files at the time of use: <http://www.arilabs.com/portal/downloads/ARI-MDLs.zip>

| Extraction Procedure | Liq/Liq | Sep Funnel | |
|-----------------------------------|---------|------------|-----------|
| Sample Weight/Volume | 500 mL | 500 mL | |
| Final Extract Volume | 0.5 mL | 0.5 mL | |
| Spike Level* | 2 µg/L | 2 µg/L | |
| Instrument | NT4 | NT4 | Reporting |
| ARI Data File | OE44 | OE43 | Limit |
| Date Analyzed | 2/13/09 | 2/18/09 | µg/L |
| Reporting Units | µg/L | µg/L | ppb |
| Analyte | MDL | MDL | RL |
| Azobenzene | 0.491 | 0.848 | 1.0 |
| 1-Methylnaphthalene | 0.469 | 0.751 | 1.0 |
| Phenol | 0.388 | 0.130 | 1.0 |
| Bis-(2-chloroethyl) ether | 0.379 | 0.585 | 1.0 |
| 2-Chlorophenol | 0.476 | 0.214 | 1.0 |
| 1,3-Dichlorobenzene | 0.470 | 0.656 | 1.0 |
| 1,4-Dichlorobenzene | 0.423 | 0.552 | 1.0 |
| Benzyl Alcohol * (x5) | 1.309 | 1.012 | 5.0 |
| 1,2-Dichlorobenzene | 0.420 | 0.586 | 1.0 |
| 2-Methylphenol | 0.400 | 0.257 | 1.0 |
| 2,2'-oxybis(1-chloropropane) | 0.514 | 0.633 | 1.0 |
| 4-Methylphenol | 0.345 | 0.271 | 1.0 |
| N-Nitroso-di-n-propylamine * (x5) | 1.946 | 2.808 | 5.0 |
| Hexachloroethane | 0.400 | 0.624 | 1.0 |
| Nitrobenzene | 0.440 | 0.729 | 1.0 |
| Isophorone | 0.477 | 0.699 | 1.0 |
| 2-Nitrophenol * (x5) | 1.836 | 1.514 | 5.0 |
| 2,4-Dimethylphenol | 0.351 | 0.277 | 1.0 |
| Bis-(2-chloroethoxy) methane | 0.431 | 0.672 | 1.0 |
| Benzoic Acid * (x10) | 3.696 | 1.675 | 10.0 |
| 2,4-Dichlorophenol | 1.824 | 1.578 | 5.0 |
| 1,2,4-Trichlorobenzene | 0.438 | 0.635 | 1.0 |
| Naphthalene | 0.419 | 0.648 | 1.0 |
| 4-Chloroaniline * (x5) | 2.222 | 1.533 | 5.0 |
| 2-Chloronaphthalene | 0.427 | 0.673 | 1.0 |
| Hexachlorobutadiene | 0.591 | 0.607 | 1.0 |
| 4-Chloro-3-methylphenol * (x5) | 1.946 | 1.944 | 5.0 |
| 2-Methylnaphthalene | 0.324 | 0.257 | 1.0 |
| Hexachlorocyclopentadiene * (x5) | 1.451 | 2.871 | 5.0 |
| 2,4,6-Trichlorophenol | 2.153 | 1.602 | 5.0 |
| 2,4,5-Trichlorophenol | 2.152 | 1.845 | 5.0 |



MDL and RL Summary GC-MS – SVOA Analysis of Water EPA Method 8270D

MDL's and reporting are updated periodically. Assure you are using ARI's current detection limits by downloading the files at the time of use: <http://www.arilabs.com/portal/downloads/ARI-MDLs.zip>

| Extraction Procedure | Liq/Liq | Sep Funnel | |
|------------------------------------|---------|------------|-----------|
| Sample Weight/Volume | 500 mL | 500 mL | |
| Final Extract Volume | 0.5 mL | 0.5 mL | |
| Spike Level* | 2 µg/L | 2 µg/L | |
| Instrument | NT4 | NT4 | Reporting |
| ARI Data File | OE44 | OE43 | Limit |
| Date Analyzed | 2/13/09 | 2/18/09 | µg/L |
| Reporting Units | µg/L | µg/L | ppb |
| Analyte | MDL | MDL | RL |
| 2-Nitroaniline * (x5) | 0.451 | 0.372 | 5.0 |
| Dimethylphthalate | 0.486 | 0.679 | 1.0 |
| Acenaphthylene | 0.446 | 0.657 | 1.0 |
| 2,6-Dinitrotoluene * (x5) | 3.504 | 4.708 | 5.0 |
| 3-Nitroaniline * (x5) | 3.372 | 3.524 | 5.0 |
| Acenaphthene | 0.493 | 0.721 | 1.0 |
| 2,4-Dinitrophenol * (x10) | 5.754 | 5.652 | 10.0 |
| Dibenzofuran | 0.307 | 0.277 | 1.0 |
| 4-Nitrophenol * (x5) | 2.334 | 0.951 | 5.0 |
| 2,4-Dinitrotoluene * (x5) | 2.211 | 3.506 | 5.0 |
| Fluorene | 0.496 | 0.684 | 1.0 |
| Diethylphthalate | 0.494 | 0.693 | 1.0 |
| 4-Chlorophenyl-phenyl ether | 0.459 | 0.615 | 1.0 |
| 4-Nitroaniline * (x5) | 2.677 | 0.916 | 5.0 |
| 4,6-Dinitro-2-Methylphenol * (x10) | 5.056 | 4.571 | 10.0 |
| N-Nitrosodiphenylamine | 0.460 | 0.497 | 1.0 |
| 4-Bromophenyl-phenyl ether | 0.501 | 0.694 | 1.0 |
| Hexachlorobenzene | 0.607 | 0.863 | 1.0 |
| Pentachlorophenol * (x5) | 2.424 | 1.803 | 5.0 |
| Phenanthrene | 0.453 | 0.819 | 1.0 |
| Anthracene | 0.464 | 0.726 | 1.0 |
| Carbazole | 0.479 | 0.744 | 1.0 |
| Di-n-butylphthalate | 0.458 | 0.693 | 1.0 |
| Fluoranthene | 0.586 | 0.716 | 1.0 |
| Pyrene | 0.344 | 0.753 | 1.0 |
| Butylbenzylphthalate | 0.405 | 0.619 | 1.0 |
| Benzo(a)Anthracene | 0.577 | 0.702 | 1.0 |
| 3,3'-Dichlorobenzidine * (x5) | 2.980 | 1.774 | 5.0 |
| Chrysene | 0.512 | 0.744 | 1.0 |
| bis(2-Ethylhexyl) phthalate | 0.451 | 0.714 | 1.0 |
| Di-n-octylphthalate | 0.513 | 0.737 | 1.0 |
| Benzo(b)Fluoranthene | 0.407 | 0.678 | 1.0 |



MDL and RL Summary GC-MS – SVOA Analysis of Water EPA Method 8270D

MDL's and reporting are updated periodically. Assure you are using ARI's current detection limits by downloading the files at the time of use: <http://www.arilabs.com/portal/downloads/ARI-MDLs.zip>

| Extraction Procedure | Liq/Liq | Sep Funnel | |
|-------------------------------|---------|------------|-----------|
| Sample Weight/Volume | 500 mL | 500 mL | |
| Final Extract Volume | 0.5 mL | 0.5 mL | |
| Spike Level* | 2 µg/L | 2 µg/L | |
| Instrument | NT4 | NT4 | Reporting |
| ARI Data File | OE44 | OE43 | Limit |
| Date Analyzed | 2/13/09 | 2/18/09 | µg/L |
| Reporting Units | µg/L | µg/L | ppb |
| Analyte | MDL | MDL | RL |
| Benzo(k)Fluoranthene | 0.679 | 0.698 | 1.0 |
| Benzo(a)Pyrene | 0.484 | 0.623 | 1.0 |
| Indeno(1,2,3-cd)Pyrene | 0.394 | 0.676 | 1.0 |
| Dibenzo(a,h)anthracene | 0.382 | 0.626 | 1.0 |
| Benzo(g,h,i)perylene | 0.302 | 0.897 | 1.0 |
| N-Nitrosodimethylamine * (x5) | 2.431 | 1.634 | 5.0 |
| Aniline | 0.416 | 0.228 | 1.0 |
| Butylatedhydroxytoluene (BHT) | 0.351 | 0.310 | 1.0 |
| Tributyl Phosphate | 0.974 | 0.981 | 1.0 |
| Dibutyl phenyl Phosphate | 0.808 | 0.911 | 1.0 |
| Butyl diphenyl Phosphate | 0.586 | 0.996 | 1.0 |
| Triphenyl Phosphate | 0.762 | 0.766 | 1.0 |
| Pyridine * (x5) | 0.479 | 1.035 | 5.0 |
| α-Terpineol | 0.394 | 0.400 | 1.0 |
| 1,4-Dioxane** | 0.512 | 0.270 | 2.0 |
| Benzidine * (x5) | NR | 6.075 | 10.0 |
| Retene | 0.617 | 1.018 | 1.0 |
| Acetophenone | 0.408 | 0.588 | 1.0 |

* Compounds spiked at a concentration greater by the listed factor. ** Final Volume for 1,4-Dioxane is 1.0 mL.

Method Detection Limit studies are performed in accordance with 40 CFR Part 136, Appendix B.

(NR) These compounds are analyzed using a liquid/liquid extraction.

Reporting Limit (RL) is defined as the lowest value at which qualitative detection of a given analyte is reported. Unless otherwise noted, The RL for all analytes, including those without a calculated MDL, are based on the lowest concentration used to calibrate the analytical instrument.

| MDL Verifications | | | | | |
|-------------------|-------------|------------|---------|---------------|------------------------|
| Sample Matrix | Spike Level | Extraction | Date | ARI Data File | Recovery |
| Water | 1.0 µg/L | Sep Funnel | 2/18/09 | OE43 | Mean Recovery = 94.1% |
| Water | 1.0 µg/L | Liq-Liq | 2/13/09 | OE44 | Mean Recovery = 119.8% |



MDL and RL Summary GC - MS - SIM Analysis of PNA in Water EPA Method SW-846-8270D – Liquid – Liquid Extraction

MDL's and reporting are updated periodically. Assure you are using ARI's current detection limits by downloading the files at the time of use: <http://www.arilabs.com/portal/downloads/ARI-MDLs.zip>

| | | |
|------------------------|-------------|-------------------|
| Sample Volume | 500 mL | |
| Extract Final Volume | 0.5 mL | |
| Spike Level | 20 ng/L | |
| Instrument | NT-1 & NT-2 | Reporting |
| Date Analyzed | 4/23/08 | Limit |
| ARI Data File | MK96 | ng/L |
| Reporting Units | ng/L (ppt) | Part-per-trillion |
| Analyte | MDL | RL |
| Naphthalene | 3.55 | 10.0 |
| 1-Methylnaphthalene | 3.13 | 10.0 |
| 2-Methylnaphthalene | 3.13 | 10.0 |
| Acenaphthylene | 2.16 | 10.0 |
| Acenaphthene | 5.01 | 10.0 |
| Dibenzofuran | 2.46 | 10.0 |
| Fluorene | 2.70 | 10.0 |
| Phenanthrene | 3.95 | 10.0 |
| Anthracene | 2.83 | 10.0 |
| Fluoranthene | 6.08 | 10.0 |
| Pyrene | 5.62 | 10.0 |
| Benzo(a)Anthracene | 4.14 | 10.0 |
| Chrysene | 3.49 | 10.0 |
| Benzo(b)Fluoranthene | 2.94 | 10.0 |
| Benzo(k)Fluoranthene | 3.38 | 10.0 |
| Benzo(a)Pyrene | 3.05 | 10.0 |
| Indeno(1,2,3-cd)Pyrene | 3.14 | 10.0 |
| Dibenz(a,h)Anthracene | 2.26 | 10.0 |
| Benzo(g,h,i)Perylene | 4.77 | 10.0 |

Method Detection Limit studies are performed in accordance with 40 CFR Part 136, Appendix B using seven degrees of freedom.

Reporting Limit (RL) is defined as the lowest value at which qualitative detection of a given analyte is reported. The RL is based on the MDL, method efficiency, and analyte response.

| MDL Verifications | | | | | |
|-------------------|-------------|------------|---------|---------------|--------------|
| Sample Matrix | Spike Level | Extraction | Date | ARI Data File | Recovery |
| Water | 5.00 ng/L | Liq-Liq | 4/23/08 | MK96 | 38.2 – 163 % |



Spike Recovery Control Limits Analysis of PCB / Aroclors in Aqueous Samples - EPA SW-846 Methods 8081 & 8082 ^(1,2)

Effective 5/1/09

Control limits are updated periodically. Assure that you have ARI's current control limits by downloading the files at the time of use. <http://www.arilabs.com/portal/downloads/ARI-CLs.zip>

| Analytical Method: | Standard Analysis | MTCA Analysis | Low Level Analysis | Manchester Extraction |
|---|-------------------|-----------------|--------------------|-------------------------|
| Sample Weight / Final Volume: | 500 / 5 mL | 500 / 1 mL | 1000 / 0.5 mL | 3000 / 1 mL |
| LCS Spike Recovery ⁽⁴⁾ | | | | |
| Aroclor 1016 | 45 - 121 | 36 - 100 | 44 - 117 | 30 - 160 ⁽³⁾ |
| Aroclor 1260 | 54 - 129 | 41 - 113 | 46 - 131 | 30 - 160 ⁽³⁾ |
| | | | | |
| Method Blank/LCS Surrogate Recovery | | | | |
| Tetrachloro- <i>meta</i> -xylene (TCMX) | 40 - 118 | 29 - 100 | 31 - 100 | 30 - 160 ⁽³⁾ |
| Decachlorobiphenyl | 41 - 111 | 35 - 116 | 32 - 108 | 30 - 160 ⁽³⁾ |
| | | | | |
| Sample Surrogate Recovery | | | | |
| Tetrachloro- <i>meta</i> -xylene (TCMX) | 38 - 118 | 25 - 100 | 21 - 100 | 30 - 160 ⁽³⁾ |
| Decachlorobiphenyl | 29 - 118 | 10 - 128 | 19 - 111 | 30 - 160 ⁽³⁾ |

(1) Control Limits calculated using all data generated 1/1/08 through 12/1/08.

(2) Highlighted control limits (**bold font**) adjusted to demonstrate that ARI does not use control limits < 10 for the lower limit or < 100 for the upper limit.

(3) 30 - 160 are default, advisory control limits used when there is insufficient data to calculate historic control limits. **DO NOT** use these limits as the sole reason to reject the data from a batch of analyses.

(4) Laboratory Control Sample (LCS) spike recovery control limits also used as advisory control limits for sample matrix spike (MS) analyzes. MS recovery values are advisory and not used to assess the acceptability of an analytical batch.



Spike Recovery Control Limits - Analysis of PCB / Aroclors in Soil & Sediment Samples - EPA SW-846 Method 8082

Effective 5/1/09

Control limits are updated periodically. Assure that you have ARI's current control limits by downloading the files at the time of use. <http://www.arilabs.com/portal/downloads/ARI-CLs.zip>

| | Routine Analysis | PSDDA | Low Level | Low level | Soxhlet Extraction | Medium Level |
|--|---------------------|----------|-----------------|-----------|-----------------------|-----------------|
| Typical Reporting Limit (µg/kg): | 33 | 20 | 10 | 4 | 100 | 800 |
| Nominal Sample Wet Weight (g): | 12 | 25 | 25 | 25 | 10 | 5 |
| Final Extract Volume (mL): | 4 | 5 | 2.5 | 1 | 10 | 40 |
| LCS Spike Recovery ^(1,2) | | | | | | |
| Aroclor 1016 | 48 - 106 | 52 - 101 | 53 - 100 | 37 - 106 | 30 - 160 ³ | 59 - 108 |
| Aroclor 1260 | 50 - 121 | 52 - 126 | 58 - 112 | 50 - 116 | 30 - 160 ³ | 43 - 177 |
| | | | | | | |
| Method Blank / LCS Surrogate Recovery | | | | | | |
| Tetrachloro- <i>meta</i> -xylene (TCMX) | 46 - 111 | 47 - 110 | 43 - 108 | 35 - 100 | 30 - 160 ³ | 49 - 110 |
| Decachlorobiphenyl | 51 - 112 | 48 - 119 | 48 - 118 | 40 - 109 | 30 - 160 ³ | 51 - 127 |
| | | | | | | |
| Sample Surrogate Recovery | | | | | | |
| Tetrachloro- <i>meta</i> -xylene (TCMX) | 50 - 114 | 46 - 113 | 35 - 119 | 38 - 102 | 30 - 160 ³ | 28 - 106 |
| Decachlorobiphenyl | 42 - 127 | 40 - 130 | 33 - 143 | 34 - 141 | 30 - 160 ³ | 22 - 168 |

(1) Laboratory Control Sample (LCS) spike recovery control limits also used as advisory control limits for sample matrix spike (MS) analyzes. MS recovery values are advisory and not used to assess the acceptability of an analytical batch.

(2) Highlighted control limits (**bold font**) adjusted to demonstrate that ARI does not use control limits < 10 for the lower limit or < 100 for the upper limit.

(3) 30 - 160 are default, advisory control limits used when there is insufficient data to calculate historic control limits. **DO NOT** use these limits as the sole reason to reject the data from a batch of analyses.



Summary of Laboratory Control Limits Metals Analyses (All Methods & Sample Matrices)

Effective 5/1/09

Control limits are updated periodically. Assure that you have ARI's current control limits by downloading the files at the time of use. <http://www.arilabs.com/portal/downloads/ARI-CLs.zip>

| Element | Matrix Spike Recovery | LCS Recovery | Replicate RPD |
|-----------|-----------------------|--------------|---------------|
| Aluminum | 75 - 125 | 80 - 120 | ≤ 20% |
| Antimony | 75 - 125 | 80 - 120 | ≤ 20% |
| Arsenic | 75 - 125 | 80 - 120 | ≤ 20% |
| Barium | 75 - 125 | 80 - 120 | ≤ 20% |
| Beryllium | 75 - 125 | 80 - 120 | ≤ 20% |
| Boron | 75 - 125 | 80 - 120 | ≤ 20% |
| Cadmium | 75 - 125 | 80 - 120 | ≤ 20% |
| Calcium | 75 - 125 | 80 - 120 | ≤ 20% |
| Chromium | 75 - 125 | 80 - 120 | ≤ 20% |
| Cobalt | 75 - 125 | 80 - 120 | ≤ 20% |
| Copper | 75 - 125 | 80 - 120 | ≤ 20% |
| Iron | 75 - 125 | 80 - 120 | ≤ 20% |
| Lead | 75 - 125 | 80 - 120 | ≤ 20% |
| Magnesium | 75 - 125 | 80 - 120 | ≤ 20% |
| Manganese | 75 - 125 | 80 - 120 | ≤ 20% |
| Mercury | 75 - 125 | 80 - 120 | ≤ 20% |
| Nickel | 75 - 125 | 80 - 120 | ≤ 20% |
| Potassium | 75 - 125 | 80 - 120 | ≤ 20% |
| Selenium | 75 - 125 | 80 - 120 | ≤ 20% |
| Silica | 75 - 125 | 80 - 120 | ≤ 20% |
| Silver | 75 - 125 | 80 - 120 | ≤ 20% |
| Sodium | 75 - 125 | 80 - 120 | ≤ 20% |
| Strontium | 75 - 125 | 80 - 120 | ≤ 20% |
| Thallium | 75 - 125 | 80 - 120 | ≤ 20% |
| Vanadium | 75 - 125 | 80 - 120 | ≤ 20% |
| Zinc | 75 - 125 | 80 - 120 | ≤ 20% |

Data Summary Package

prepared
for

The Boeing Company

Project: Plant 2 Source Control, 013-1646-009.500

ARI JOB NO: PW88, PW89

prepared
by

Analytical Resources, Inc.

SEMIVOLATILE ANALYSIS

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Page 1 of 2



Sample ID: PL2SC-W-G-110909
SAMPLE

Lab Sample ID: PW89F

LIMS ID: 09-27531

Matrix: Water

Data Release Authorized: VTS

Reported: 11/18/09

QC Report No: PW89-The Boeing Company

Project: Plant 2 Source Control

013-1646-009.500

Date Sampled: 11/09/09

Date Received: 11/09/09

Date Extracted: 11/11/09

Date Analyzed: 11/16/09 18:19

Instrument/Analyst: NT6/JZ

Sample Amount: 500 mL

Final Extract Volume: 0.50 mL

Dilution Factor: 1.00

| CAS Number | Analyte | RL | Result |
|------------|------------------------------|-----|---------|
| 108-95-2 | Phenol | 1.0 | < 1.0 U |
| 111-44-4 | Bis-(2-Chloroethyl) Ether | 1.0 | < 1.0 U |
| 95-57-8 | 2-Chlorophenol | 1.0 | < 1.0 U |
| 541-73-1 | 1,3-Dichlorobenzene | 1.0 | < 1.0 U |
| 106-46-7 | 1,4-Dichlorobenzene | 1.0 | < 1.0 U |
| 100-51-6 | Benzyl Alcohol | 5.0 | < 5.0 U |
| 95-50-1 | 1,2-Dichlorobenzene | 1.0 | < 1.0 U |
| 95-48-7 | 2-Methylphenol | 1.0 | < 1.0 U |
| 108-60-1 | 2,2'-Oxybis(1-Chloropropane) | 1.0 | < 1.0 U |
| 106-44-5 | 4-Methylphenol | 1.0 | < 1.0 U |
| 621-64-7 | N-Nitroso-Di-N-Propylamine | 5.0 | < 5.0 U |
| 67-72-1 | Hexachloroethane | 1.0 | < 1.0 U |
| 98-95-3 | Nitrobenzene | 1.0 | < 1.0 U |
| 78-59-1 | Isophorone | 1.0 | < 1.0 U |
| 88-75-5 | 2-Nitrophenol | 5.0 | < 5.0 U |
| 105-67-9 | 2,4-Dimethylphenol | 1.0 | < 1.0 U |
| 65-85-0 | Benzoic Acid | 10 | < 10 U |
| 111-91-1 | bis(2-Chloroethoxy) Methane | 1.0 | < 1.0 U |
| 120-83-2 | 2,4-Dichlorophenol | 5.0 | < 5.0 U |
| 120-82-1 | 1,2,4-Trichlorobenzene | 1.0 | < 1.0 U |
| 91-20-3 | Naphthalene | 1.0 | < 1.0 U |
| 106-47-8 | 4-Chloroaniline | 5.0 | < 5.0 U |
| 87-68-3 | Hexachlorobutadiene | 1.0 | < 1.0 U |
| 59-50-7 | 4-Chloro-3-methylphenol | 5.0 | < 5.0 U |
| 91-57-6 | 2-Methylnaphthalene | 1.0 | < 1.0 U |
| 77-47-4 | Hexachlorocyclopentadiene | 5.0 | < 5.0 U |
| 88-06-2 | 2,4,6-Trichlorophenol | 5.0 | < 5.0 U |
| 95-95-4 | 2,4,5-Trichlorophenol | 5.0 | < 5.0 U |
| 91-58-7 | 2-Chloronaphthalene | 1.0 | < 1.0 U |
| 88-74-4 | 2-Nitroaniline | 5.0 | < 5.0 U |
| 131-11-3 | Dimethylphthalate | 1.0 | < 1.0 U |
| 208-96-8 | Acenaphthylene | 1.0 | < 1.0 U |
| 99-09-2 | 3-Nitroaniline | 5.0 | < 5.0 U |

Sample ID: PL2SC-W-G-110909
SAMPLE

Lab Sample ID: PW89F
LIMS ID: 09-27531
Matrix: Water
Date Analyzed: 11/16/09 18:19

QC Report No: PW89-The Boeing Company
Project: Plant 2 Source Control
013-1646-009.500

| CAS Number | Analyte | RL | Result |
|------------|----------------------------|-----|---------|
| 83-32-9 | Acenaphthene | 1.0 | < 1.0 U |
| 51-28-5 | 2,4-Dinitrophenol | 10 | < 10 U |
| 100-02-7 | 4-Nitrophenol | 5.0 | < 5.0 U |
| 132-64-9 | Dibenzofuran | 1.0 | < 1.0 U |
| 606-20-2 | 2,6-Dinitrotoluene | 5.0 | < 5.0 U |
| 121-14-2 | 2,4-Dinitrotoluene | 5.0 | < 5.0 U |
| 84-66-2 | Diethylphthalate | 1.0 | < 1.0 U |
| 7005-72-3 | 4-Chlorophenyl-phenylether | 1.0 | < 1.0 U |
| 86-73-7 | Fluorene | 1.0 | < 1.0 U |
| 100-01-6 | 4-Nitroaniline | 5.0 | < 5.0 U |
| 534-52-1 | 4,6-Dinitro-2-Methylphenol | 10 | < 10 U |
| 86-30-6 | N-Nitrosodiphenylamine | 1.0 | < 1.0 U |
| 101-55-3 | 4-Bromophenyl-phenylether | 1.0 | < 1.0 U |
| 118-74-1 | Hexachlorobenzene | 1.0 | < 1.0 U |
| 87-86-5 | Pentachlorophenol | 5.0 | < 5.0 U |
| 85-01-8 | Phenanthrene | 1.0 | < 1.0 U |
| 86-74-8 | Carbazole | 1.0 | < 1.0 U |
| 120-12-7 | Anthracene | 1.0 | < 1.0 U |
| 84-74-2 | Di-n-Butylphthalate | 1.0 | < 1.0 U |
| 206-44-0 | Fluoranthene | 1.0 | < 1.0 U |
| 129-00-0 | Pyrene | 1.0 | < 1.0 U |
| 85-68-7 | Butylbenzylphthalate | 1.0 | < 1.0 U |
| 91-94-1 | 3,3'-Dichlorobenzidine | 5.0 | < 5.0 U |
| 56-55-3 | Benzo(a)anthracene | 1.0 | < 1.0 U |
| 117-81-7 | bis(2-Ethylhexyl)phthalate | 1.0 | < 1.0 U |
| 218-01-9 | Chrysene | 1.0 | < 1.0 U |
| 117-84-0 | Di-n-Octyl phthalate | 1.0 | < 1.0 U |
| 205-99-2 | Benzo(b)fluoranthene | 1.0 | < 1.0 U |
| 207-08-9 | Benzo(k)fluoranthene | 1.0 | < 1.0 U |
| 50-32-8 | Benzo(a)pyrene | 1.0 | < 1.0 U |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | 1.0 | < 1.0 U |
| 53-70-3 | Dibenz(a,h)anthracene | 1.0 | < 1.0 U |
| 191-24-2 | Benzo(g,h,i)perylene | 1.0 | < 1.0 U |
| 90-12-0 | 1-Methylnaphthalene | 1.0 | < 1.0 U |

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery

| | | | |
|----------------------|-------|------------------------|-------|
| d5-Nitrobenzene | 69.2% | 2-Fluorobiphenyl | 78.8% |
| d14-p-Terphenyl | 95.2% | d4-1,2-Dichlorobenzene | 68.0% |
| d5-Phenol | 75.2% | 2-Fluorophenol | 68.0% |
| 2,4,6-Tribromophenol | 84.0% | d4-2-Chlorophenol | 68.8% |

SW8270 SEMIVOLATILES WATER SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: PW89-The Boeing Company
Project: Plant 2 Source Control
013-1646-009.500

| Client ID | NBZ | FBP | TPH | DCB | PHL | 2FP | TBP | 2CP | TOT | OUT |
|------------------|-------|-------|-------|-------|-------|-------|-------|-------|-----|-----|
| MB-111109 | 70.0% | 72.0% | 101% | 64.8% | 73.3% | 68.3% | 84.3% | 69.1% | 0 | |
| LCS-111109 | 76.4% | 84.8% | 104% | 84.8% | 78.1% | 74.4% | 91.5% | 77.6% | 0 | |
| LCSD-111109 | 78.4% | 83.6% | 106% | 76.8% | 87.7% | 76.0% | 94.1% | 76.5% | 0 | |
| PL2SC-W-G-110909 | 69.2% | 78.8% | 95.2% | 68.0% | 75.2% | 68.0% | 84.0% | 68.8% | 0 | |

| | LCS/MB LIMITS | QC LIMITS |
|--------------------------------|---------------|-----------|
| (NBZ) = d5-Nitrobenzene | (46-100) | (39-100) |
| (FBP) = 2-Fluorobiphenyl | (49-100) | (42-100) |
| (TPH) = d14-p-Terphenyl | (53-119) | (26-114) |
| (DCB) = d4-1,2-Dichlorobenzene | (38-100) | (32-100) |
| (PHL) = d5-Phenol | (50-100) | (41-100) |
| (2FP) = 2-Fluorophenol | (46-100) | (38-100) |
| (TBP) = 2,4,6-Tribromophenol | (52-123) | (48-118) |
| (2CP) = d4-2-Chlorophenol | (53-100) | (44-100) |

Prep Method: SW3520C
Log Number Range: 09-27531 to 09-27531

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Page 1 of 2



Sample ID: LCS-111109
LCS/LCSD

Lab Sample ID: LCS-111109
LIMS ID: 09-27531
Matrix: Water
Data Release Authorized: VTS
Reported: 11/18/09

QC Report No: PW89-The Boeing Company
Project: Plant 2 Source Control
013-1646-009.500
Date Sampled: 11/09/09
Date Received: 11/09/09

Date Extracted LCS/LCSD: 11/11/09

Sample Amount LCS: 500 mL

Date Analyzed LCS: 11/16/09 17:14

LCSD: 500 mL

LCSD: 11/16/09 17:46

Final Extract Volume LCS: 0.50 mL

Instrument/Analyst LCS: NT6/JZ

LCSD: 0.50 mL

LCSD: NT6/JZ

Dilution Factor LCS: 1.00

LCSD: 1.00

GPC Cleanup: NO

| Analyte | LCS | Spike Added-LCS | LCS Recovery | LCSD | Spike Added-LCSD | LCSD Recovery | RPD |
|------------------------------|--------|-----------------|--------------|--------|------------------|---------------|-------|
| Phenol | 20.4 | 25.0 | 81.6% | 21.4 | 25.0 | 85.6% | 4.8% |
| Bis-(2-Chloroethyl) Ether | 21.0 | 25.0 | 84.0% | 20.7 | 25.0 | 82.8% | 1.4% |
| 2-Chlorophenol | 21.1 | 25.0 | 84.4% | 21.2 | 25.0 | 84.8% | 0.5% |
| 1,3-Dichlorobenzene | 18.8 | 25.0 | 75.2% | 15.5 | 25.0 | 62.0% | 19.2% |
| 1,4-Dichlorobenzene | 18.3 | 25.0 | 73.2% | 15.5 | 25.0 | 62.0% | 16.6% |
| Benzyl Alcohol | 39.3 | 50.0 | 78.6% | 44.8 | 50.0 | 89.6% | 13.1% |
| 1,2-Dichlorobenzene | 20.2 | 25.0 | 80.8% | 17.1 | 25.0 | 68.4% | 16.6% |
| 2-Methylphenol | 21.5 | 25.0 | 86.0% | 21.6 | 25.0 | 86.4% | 0.5% |
| 2,2'-Oxybis(1-Chloropropane) | 26.4 Q | 25.0 | 106% | 26.4 Q | 25.0 | 106% | 0.0% |
| 4-Methylphenol | 42.2 | 50.0 | 84.4% | 43.7 | 50.0 | 87.4% | 3.5% |
| N-Nitroso-Di-N-Propylamine | 20.8 | 25.0 | 83.2% | 20.8 | 25.0 | 83.2% | 0.0% |
| Hexachloroethane | 15.3 | 25.0 | 61.2% | 12.2 | 25.0 | 48.8% | 22.5% |
| Nitrobenzene | 23.2 | 25.0 | 92.8% | 23.6 | 25.0 | 94.4% | 1.7% |
| Isophorone | 21.2 | 25.0 | 84.8% | 21.8 | 25.0 | 87.2% | 2.8% |
| 2-Nitrophenol | 22.0 | 25.0 | 88.0% | 22.2 | 25.0 | 88.8% | 0.9% |
| 2,4-Dimethylphenol | 19.7 | 25.0 | 78.8% | 16.0 | 25.0 | 64.0% | 20.7% |
| Benzoic Acid | 80.0 | 75.0 | 107% | 82.1 | 75.0 | 109% | 2.6% |
| bis(2-Chloroethoxy) Methane | 2.9 | 25.0 | 11.6% | 21.2 | 25.0 | 84.8% | 152% |
| 2,4-Dichlorophenol | 21.4 | 25.0 | 85.6% | 21.4 | 25.0 | 85.6% | 0.0% |
| 1,2,4-Trichlorobenzene | 18.1 | 25.0 | 72.4% | 15.3 | 25.0 | 61.2% | 16.8% |
| Naphthalene | 21.2 | 25.0 | 84.8% | 19.9 | 25.0 | 79.6% | 6.3% |
| 4-Chloroaniline | 4.4 J | 60.0 | 7.3% | 59.3 | 60.0 | 98.8% | 172% |
| Hexachlorobutadiene | 15.1 Q | 25.0 | 60.4% | 11.6 Q | 25.0 | 46.4% | 26.2% |
| 4-Chloro-3-methylphenol | 22.1 | 25.0 | 88.4% | 23.0 | 25.0 | 92.0% | 4.0% |
| 2-Methylnaphthalene | 22.1 | 25.0 | 88.4% | 20.6 | 25.0 | 82.4% | 7.0% |
| Hexachlorocyclopentadiene | 6.4 Q | 75.0 | 8.5% | 7.1 Q | 75.0 | 9.5% | 10.7% |
| 2,4,6-Trichlorophenol | 20.6 | 25.0 | 82.4% | 21.1 | 25.0 | 84.4% | 2.4% |
| 2,4,5-Trichlorophenol | 21.4 | 25.0 | 85.6% | 22.1 | 25.0 | 88.4% | 3.2% |
| 2-Chloronaphthalene | 21.1 | 25.0 | 84.4% | 20.2 | 25.0 | 80.8% | 4.4% |
| 2-Nitroaniline | 21.2 | 25.0 | 84.8% | 23.2 | 25.0 | 92.8% | 9.0% |
| Dimethylphthalate | 22.6 | 25.0 | 90.4% | 23.2 | 25.0 | 92.8% | 2.6% |
| Acenaphthylene | 11.5 | 25.0 | 46.0% | 22.0 | 25.0 | 88.0% | 62.7% |
| 3-Nitroaniline | 2.9 J | 64.0 | 4.5% | 72.0 | 64.0 | 112% | 184% |
| Acenaphthene | 22.1 | 25.0 | 88.4% | 22.2 | 25.0 | 88.8% | 0.5% |
| 2,4-Dinitrophenol | 53.7 Q | 75.0 | 71.6% | 54.0 Q | 75.0 | 72.0% | 0.6% |
| 4-Nitrophenol | 19.4 | 25.0 | 77.6% | 18.8 | 25.0 | 75.2% | 3.1% |
| Dibenzofuran | 21.1 | 25.0 | 84.4% | 21.2 | 25.0 | 84.8% | 0.5% |
| 2,6-Dinitrotoluene | 22.5 | 25.0 | 90.0% | 23.1 | 25.0 | 92.4% | 2.6% |

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Page 2 of 2



Sample ID: LCS-111109
LCS/LCSD

Lab Sample ID: LCS-111109
LIMS ID: 09-27531
Matrix: Water
Date Analyzed LCS: 11/16/09 17:14
LCSD: 11/16/09 17:46

QC Report No: PW89-The Boeing Company
Project: Plant 2 Source Control
013-1646-009.500

| Analyte | LCS | Spike Added-LCS | LCS Recovery | LCSD | Spike Added-LCSD | LCSD Recovery | RPD |
|----------------------------|---------|--------------------|-----------------|--------|---------------------|------------------|-------|
| 2,4-Dinitrotoluene | 23.9 | 25.0 | 95.6% | 24.5 | 25.0 | 98.0% | 2.5% |
| Diethylphthalate | 23.2 | 25.0 | 92.8% | 24.0 | 25.0 | 96.0% | 3.4% |
| 4-Chlorophenyl-phenylether | 20.0 | 25.0 | 80.0% | 20.1 | 25.0 | 80.4% | 0.5% |
| Fluorene | 22.4 | 25.0 | 89.6% | 22.9 | 25.0 | 91.6% | 2.2% |
| 4-Nitroaniline | 8.2 | 25.0 | 32.8% | 25.2 | 25.0 | 101% | 101% |
| 4,6-Dinitro-2-Methylphenol | 57.5 | 75.0 | 76.7% | 58.6 | 75.0 | 78.1% | 1.9% |
| N-Nitrosodiphenylamine | 10.8 | 25.0 | 43.2% | 21.6 | 25.0 | 86.4% | 66.7% |
| 4-Bromophenyl-phenylether | 20.8 | 25.0 | 83.2% | 21.0 | 25.0 | 84.0% | 1.0% |
| Hexachlorobenzene | 22.7 | 25.0 | 90.8% | 22.5 | 25.0 | 90.0% | 0.9% |
| Pentachlorophenol | 24.6 | 25.0 | 98.4% | 24.2 | 25.0 | 96.8% | 1.6% |
| Phenanthrene | 24.0 | 25.0 | 96.0% | 24.2 | 25.0 | 96.8% | 0.8% |
| Carbazole | 12.8 | 25.0 | 51.2% | 24.8 | 25.0 | 99.2% | 63.8% |
| Anthracene | 22.1 | 25.0 | 88.4% | 23.5 | 25.0 | 94.0% | 6.1% |
| Di-n-Butylphthalate | 26.8 | 25.0 | 107% | 27.2 | 25.0 | 109% | 1.5% |
| Fluoranthene | 24.5 | 25.0 | 98.0% | 24.6 | 25.0 | 98.4% | 0.4% |
| Pyrene | 23.1 | 25.0 | 92.4% | 24.6 | 25.0 | 98.4% | 6.3% |
| Butylbenzylphthalate | 25.2 Q | 25.0 | 101% | 28.5 Q | 25.0 | 114% | 12.3% |
| 3,3'-Dichlorobenzidine | < 5.0 U | 64.0 | NA% | 60.0 | 64.0 | 93.8% | NA |
| Benzo(a)anthracene | 22.1 | 25.0 | 88.4% | 22.7 | 25.0 | 90.8% | 2.7% |
| bis(2-Ethylhexyl)phthalate | 25.7 | 25.0 | 103% | 37.6 | 25.0 | 150% | 37.6% |
| Chrysene | 21.5 | 25.0 | 86.0% | 22.1 | 25.0 | 88.4% | 2.8% |
| Di-n-Octyl phthalate | 21.6 | 25.0 | 86.4% | 22.0 | 25.0 | 88.0% | 1.8% |
| Benzo(b)fluoranthene | 22.4 | 25.0 | 89.6% | 23.0 | 25.0 | 92.0% | 2.6% |
| Benzo(k)fluoranthene | 22.4 | 25.0 | 89.6% | 23.0 | 25.0 | 92.0% | 2.6% |
| Benzo(a)pyrene | 17.6 | 25.0 | 70.4% | 22.4 | 25.0 | 89.6% | 24.0% |
| Indeno(1,2,3-cd)pyrene | 15.8 | 25.0 | 63.2% | 20.7 | 25.0 | 82.8% | 26.8% |
| Dibenz(a,h)anthracene | 20.4 | 25.0 | 81.6% | 20.7 | 25.0 | 82.8% | 1.5% |
| Benzo(g,h,i)perylene | 15.9 | 25.0 | 63.6% | 16.8 | 25.0 | 67.2% | 5.5% |
| 1-Methylnaphthalene | 22.8 | 25.0 | 91.2% | 21.7 | 25.0 | 86.8% | 4.9% |

Semivolatile Surrogate Recovery

| | LCS | LCSD |
|------------------------|-------|-------|
| d5-Nitrobenzene | 76.4% | 78.4% |
| 2-Fluorobiphenyl | 84.8% | 83.6% |
| d14-p-Terphenyl | 104% | 106% |
| d4-1,2-Dichlorobenzene | 84.8% | 76.8% |
| d5-Phenol | 78.1% | 87.7% |
| 2-Fluorophenol | 74.4% | 76.0% |
| 2,4,6-Tribromophenol | 91.5% | 94.1% |
| d4-2-Chlorophenol | 77.6% | 76.5% |

Results reported in µg/L
RPD calculated using sample concentrations per SW846.

4B
SEMIVOLATILE METHOD BLANK SUMMARY

BLANK NO.

PW89MBW1

Lab Name: ANALYTICAL RESOURCES, INC

Client: THE BOEING COMPANY

ARI Job No: PW89

Project: PLANT 2 SOURCE CONTR

Lab File ID: 11160908

Date Extracted: 11/11/09

Instrument ID: NT6

Date Analyzed: 11/16/09

Matrix: LIQUID

Time Analyzed: 1641

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

| | CLIENT SAMPLE NO. | LAB SAMPLE ID | LAB FILE ID | DATE ANALYZED |
|----|----------------------|------------------|----------------|------------------|
| 01 | PW89LCSW1 | PW89LCSW1 | 11160909 | 11/16/09 |
| 02 | PW89LCSDW1 | PW89LCSDW1 | 11160910 | 11/16/09 |
| 03 | PL2SC-W-G-110909 | PW89F | 11160911 | 11/16/09 |
| 04 | | | | |
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COMMENTS:

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Page 1 of 2



Sample ID: MB-111109
METHOD BLANK

Lab Sample ID: MB-111109
LIMS ID: 09-27531
Matrix: Water
Data Release Authorized: VTS
Reported: 11/18/09

QC Report No: PW89-The Boeing Company
Project: Plant 2 Source Control
013-1646-009.500
Date Sampled: NA
Date Received: NA

Date Extracted: 11/11/09
Date Analyzed: 11/16/09 16:41
Instrument/Analyst: NT6/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00

| CAS Number | Analyte | RL | Result |
|------------|------------------------------|-----|---------|
| 108-95-2 | Phenol | 1.0 | < 1.0 U |
| 111-44-4 | Bis-(2-Chloroethyl) Ether | 1.0 | < 1.0 U |
| 95-57-8 | 2-Chlorophenol | 1.0 | < 1.0 U |
| 541-73-1 | 1,3-Dichlorobenzene | 1.0 | < 1.0 U |
| 106-46-7 | 1,4-Dichlorobenzene | 1.0 | < 1.0 U |
| 100-51-6 | Benzyl Alcohol | 5.0 | < 5.0 U |
| 95-50-1 | 1,2-Dichlorobenzene | 1.0 | < 1.0 U |
| 95-48-7 | 2-Methylphenol | 1.0 | < 1.0 U |
| 108-60-1 | 2,2'-Oxybis(1-Chloropropane) | 1.0 | < 1.0 U |
| 106-44-5 | 4-Methylphenol | 1.0 | < 1.0 U |
| 621-64-7 | N-Nitroso-Di-N-Propylamine | 5.0 | < 5.0 U |
| 67-72-1 | Hexachloroethane | 1.0 | < 1.0 U |
| 98-95-3 | Nitrobenzene | 1.0 | < 1.0 U |
| 78-59-1 | Isophorone | 1.0 | < 1.0 U |
| 88-75-5 | 2-Nitrophenol | 5.0 | < 5.0 U |
| 105-67-9 | 2,4-Dimethylphenol | 1.0 | < 1.0 U |
| 65-85-0 | Benzoic Acid | 10 | < 10 U |
| 111-91-1 | bis(2-Chloroethoxy) Methane | 1.0 | < 1.0 U |
| 120-83-2 | 2,4-Dichlorophenol | 5.0 | < 5.0 U |
| 120-82-1 | 1,2,4-Trichlorobenzene | 1.0 | < 1.0 U |
| 91-20-3 | Naphthalene | 1.0 | < 1.0 U |
| 106-47-8 | 4-Chloroaniline | 5.0 | < 5.0 U |
| 87-68-3 | Hexachlorobutadiene | 1.0 | < 1.0 U |
| 59-50-7 | 4-Chloro-3-methylphenol | 5.0 | < 5.0 U |
| 91-57-6 | 2-Methylnaphthalene | 1.0 | < 1.0 U |
| 77-47-4 | Hexachlorocyclopentadiene | 5.0 | < 5.0 U |
| 88-06-2 | 2,4,6-Trichlorophenol | 5.0 | < 5.0 U |
| 95-95-4 | 2,4,5-Trichlorophenol | 5.0 | < 5.0 U |
| 91-58-7 | 2-Chloronaphthalene | 1.0 | < 1.0 U |
| 88-74-4 | 2-Nitroaniline | 5.0 | < 5.0 U |
| 131-11-3 | Dimethylphthalate | 1.0 | < 1.0 U |
| 208-96-8 | Acenaphthylene | 1.0 | < 1.0 U |
| 99-09-2 | 3-Nitroaniline | 5.0 | < 5.0 U |

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Page 2 of 2



Sample ID: MB-111109
METHOD BLANK

Lab Sample ID: MB-111109
LIMS ID: 09-27531
Matrix: Water
Date Analyzed: 11/16/09 16:41

QC Report No: PW89-The Boeing Company
Project: Plant 2 Source Control
013-1646-009.500

| CAS Number | Analyte | RL | Result |
|------------|----------------------------|-----|---------|
| 83-32-9 | Acenaphthene | 1.0 | < 1.0 U |
| 51-28-5 | 2,4-Dinitrophenol | 10 | < 10 U |
| 100-02-7 | 4-Nitrophenol | 5.0 | < 5.0 U |
| 132-64-9 | Dibenzofuran | 1.0 | < 1.0 U |
| 606-20-2 | 2,6-Dinitrotoluene | 5.0 | < 5.0 U |
| 121-14-2 | 2,4-Dinitrotoluene | 5.0 | < 5.0 U |
| 84-66-2 | Diethylphthalate | 1.0 | < 1.0 U |
| 7005-72-3 | 4-Chlorophenyl-phenylether | 1.0 | < 1.0 U |
| 86-73-7 | Fluorene | 1.0 | < 1.0 U |
| 100-01-6 | 4-Nitroaniline | 5.0 | < 5.0 U |
| 534-52-1 | 4,6-Dinitro-2-Methylphenol | 10 | < 10 U |
| 86-30-6 | N-Nitrosodiphenylamine | 1.0 | < 1.0 U |
| 101-55-3 | 4-Bromophenyl-phenylether | 1.0 | < 1.0 U |
| 118-74-1 | Hexachlorobenzene | 1.0 | < 1.0 U |
| 87-86-5 | Pentachlorophenol | 5.0 | < 5.0 U |
| 85-01-8 | Phenanthrene | 1.0 | < 1.0 U |
| 86-74-8 | Carbazole | 1.0 | < 1.0 U |
| 120-12-7 | Anthracene | 1.0 | < 1.0 U |
| 84-74-2 | Di-n-Butylphthalate | 1.0 | < 1.0 U |
| 206-44-0 | Fluoranthene | 1.0 | < 1.0 U |
| 129-00-0 | Pyrene | 1.0 | < 1.0 U |
| 85-68-7 | Butylbenzylphthalate | 1.0 | < 1.0 U |
| 91-94-1 | 3,3'-Dichlorobenzidine | 5.0 | < 5.0 U |
| 56-55-3 | Benzo(a)anthracene | 1.0 | < 1.0 U |
| 117-81-7 | bis(2-Ethylhexyl)phthalate | 1.0 | < 1.0 U |
| 218-01-9 | Chrysene | 1.0 | < 1.0 U |
| 117-84-0 | Di-n-Octyl phthalate | 1.0 | < 1.0 U |
| 205-99-2 | Benzo(b)fluoranthene | 1.0 | < 1.0 U |
| 207-08-9 | Benzo(k)fluoranthene | 1.0 | < 1.0 U |
| 50-32-8 | Benzo(a)pyrene | 1.0 | < 1.0 U |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | 1.0 | < 1.0 U |
| 53-70-3 | Dibenz(a,h)anthracene | 1.0 | < 1.0 U |
| 191-24-2 | Benzo(g,h,i)perylene | 1.0 | < 1.0 U |
| 90-12-0 | 1-Methylnaphthalene | 1.0 | < 1.0 U |

Reported in $\mu\text{g/L}$ (ppb)

Semivolatile Surrogate Recovery

| | | | |
|----------------------|-------|------------------------|-------|
| d5-Nitrobenzene | 70.0% | 2-Fluorobiphenyl | 72.0% |
| d14-p-Terphenyl | 101% | d4-1,2-Dichlorobenzene | 64.8% |
| d5-Phenol | 73.3% | 2-Fluorophenol | 68.3% |
| 2,4,6-Tribromophenol | 84.3% | d4-2-Chlorophenol | 69.1% |

SIM SEMIVOLATILE ANALYSIS

Sample ID: PL2SC-W-G-110909
SAMPLE

Lab Sample ID: PW89F
LIMS ID: 09-27531
Matrix: Water
Data Release Authorized: *MW*
Reported: 11/17/09

QC Report No: PW89-The Boeing Company
Project: Plant 2 Source Control
Event: 013-1646-009.500
Date Sampled: 11/09/09
Date Received: 11/09/09

Date Extracted: 11/11/09
Date Analyzed: 11/16/09 14:31
Instrument/Analyst: NT2/PK

Sample Amount: 500 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00

| CAS Number | Analyte | RL | Result |
|------------|------------------------|------|----------|
| 91-20-3 | Naphthalene | 0.10 | < 0.10 U |
| 91-57-6 | 2-Methylnaphthalene | 0.10 | < 0.10 U |
| 90-12-0 | 1-Methylnaphthalene | 0.10 | < 0.10 U |
| 208-96-8 | Acenaphthylene | 0.10 | < 0.10 U |
| 83-32-9 | Acenaphthene | 0.10 | < 0.10 U |
| 86-73-7 | Fluorene | 0.10 | < 0.10 U |
| 85-01-8 | Phenanthrene | 0.10 | < 0.10 U |
| 120-12-7 | Anthracene | 0.10 | < 0.10 U |
| 206-44-0 | Fluoranthene | 0.10 | < 0.10 U |
| 129-00-0 | Pyrene | 0.10 | < 0.10 U |
| 56-55-3 | Benzo(a)anthracene | 0.10 | < 0.10 U |
| 218-01-9 | Chrysene | 0.10 | < 0.10 U |
| 205-99-2 | Benzo(b)fluoranthene | 0.10 | < 0.10 U |
| 207-08-9 | Benzo(k)fluoranthene | 0.10 | < 0.10 U |
| 50-32-8 | Benzo(a)pyrene | 0.10 | < 0.10 U |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | 0.10 | < 0.10 U |
| 53-70-3 | Dibenz(a,h)anthracene | 0.10 | < 0.10 U |
| 191-24-2 | Benzo(g,h,i)perylene | 0.10 | < 0.10 U |
| 132-64-9 | Dibenzofuran | 0.10 | < 0.10 U |

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene 62.0%
d14-Dibenzo(a,h)anthracene 69.7%

SIM SW8270 SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: PW89-The Boeing Company
Project: Plant 2 Source Control
013-1646-009.500

| Client ID | MNP | DBA | TOT OUT |
|------------------|-------|-------|---------|
| MB-111109 | 61.0% | 73.7% | 0 |
| LCS-111109 | 65.3% | 60.0% | 0 |
| LCSD-111109 | 66.7% | 63.3% | 0 |
| PL2SC-W-G-110909 | 62.0% | 69.7% | 0 |

| | LCS/MB LIMITS | QC LIMITS |
|------------------------------------|---------------|-----------|
| (MNP) = d10-2-Methylnaphthalene | (36-101) | (30-106) |
| (DBA) = d14-Dibenzo(a,h)anthracene | (42-121) | (10-130) |

Prep Method: SW3520C
Log Number Range: 09-27531 to 09-27531

Sample ID: LCS-111109

LAB CONTROL SAMPLE

Lab Sample ID: LCS-111109
 LIMS ID: 09-27531
 Matrix: Water
 Data Release Authorized: *MMW*
 Reported: 11/17/09

QC Report No: PW89-The Boeing Company
 Project: Plant 2 Source Control
 Event: 013-1646-009.500
 Date Sampled: NA
 Date Received: NA

Date Extracted LCS/LCSD: 11/11/09

Sample Amount LCS: 500 mL

Date Analyzed LCS: 11/16/09 13:43

LCSD: 500 mL

LCSD: 11/16/09 14:07

Final Extract Volume LCS: 0.50 mL

LCSD: 0.50 mL

Instrument/Analyst LCS: NT2/PK

Dilution Factor LCS: 1.00

LCSD: NT2/PK

LCSD: 1.00

| Analyte | LCS | Spike Added-LCS | LCS Recovery | LCSD | Spike Added-LCSD | LCSD Recovery | RPD |
|------------------------|------|--------------------|-----------------|------|---------------------|------------------|-------|
| Naphthalene | 1.88 | 3.00 | 62.7% | 1.88 | 3.00 | 62.7% | 0.0% |
| 2-Methylnaphthalene | 1.88 | 3.00 | 62.7% | 1.87 | 3.00 | 62.3% | 0.5% |
| 1-Methylnaphthalene | 1.93 | 3.00 | 64.3% | 1.88 | 3.00 | 62.7% | 2.6% |
| Acenaphthylene | 1.85 | 3.00 | 61.7% | 1.85 | 3.00 | 61.7% | 0.0% |
| Acenaphthene | 2.05 | 3.00 | 68.3% | 2.00 | 3.00 | 66.7% | 2.5% |
| Fluorene | 2.14 | 3.00 | 71.3% | 2.10 | 3.00 | 70.0% | 1.9% |
| Phenanthrene | 2.20 | 3.00 | 73.3% | 2.09 | 3.00 | 69.7% | 5.1% |
| Anthracene | 2.03 | 3.00 | 67.7% | 1.97 | 3.00 | 65.7% | 3.0% |
| Fluoranthene | 2.23 | 3.00 | 74.3% | 2.18 | 3.00 | 72.7% | 2.3% |
| Pyrene | 2.40 | 3.00 | 80.0% | 2.31 | 3.00 | 77.0% | 3.8% |
| Benzo(a)anthracene | 2.09 | 3.00 | 69.7% | 2.01 | 3.00 | 67.0% | 3.9% |
| Chrysene | 2.16 | 3.00 | 72.0% | 2.24 | 3.00 | 74.7% | 3.6% |
| Benzo(b)fluoranthene | 2.21 | 3.00 | 73.7% | 2.02 | 3.00 | 67.3% | 9.0% |
| Benzo(k)fluoranthene | 2.30 | 3.00 | 76.7% | 2.32 | 3.00 | 77.3% | 0.9% |
| Benzo(a)pyrene | 1.83 | 3.00 | 61.0% | 0.65 | 3.00 | 21.7% | 95.2% |
| Indeno(1,2,3-cd)pyrene | 2.11 | 3.00 | 70.3% | 2.11 | 3.00 | 70.3% | 0.0% |
| Dibenz(a,h)anthracene | 1.93 | 3.00 | 64.3% | 1.95 | 3.00 | 65.0% | 1.0% |
| Benzo(g,h,i)perylene | 2.05 | 3.00 | 68.3% | 2.05 | 3.00 | 68.3% | 0.0% |
| Dibenzofuran | 2.19 | 3.00 | 73.0% | 2.15 | 3.00 | 71.7% | 1.8% |

Reported in µg/L (ppb)

RPD calculated using sample concentrations per SW846.

SIM Semivolatile Surrogate Recovery

| | LCS | LCSD |
|----------------------------|-------|-------|
| d10-2-Methylnaphthalene | 65.3% | 66.7% |
| d14-Dibenzo(a,h)anthracene | 60.0% | 63.3% |

4B
SEMIVOLATILE METHOD BLANK SUMMARY

BLANK NO.

PW89MBW1

Lab Name: ANALYTICAL RESOURCES, INC

Client: THE BOEING COMPANY

ARI Job No: PW89

Project: PLANT 2 SOURCE CONTR

Lab File ID: 111605

Date Extracted: 11/11/09

Instrument ID: NT2

Date Analyzed: 11/16/09

Matrix: LIQUID

Time Analyzed: 1319

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

| | CLIENT SAMPLE NO. | LAB SAMPLE ID | LAB FILE ID | DATE ANALYZED |
|----|----------------------|------------------|----------------|------------------|
| 01 | PW89LCSW1 | PW89LCSW1 | 111606 | 11/16/09 |
| 02 | PW89LCSDW1 | PW89LCSDW1 | 111607 | 11/16/09 |
| 03 | PL2SC-W-G-110909 | PW89F | 111608 | 11/16/09 |
| 04 | | | | |
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COMMENTS:

ORGANICS ANALYSIS DATA SHEET

PNAs by SW8270D-SIM GC/MS

Page 1 of 1



Sample ID: MB-111109

METHOD BLANK

Lab Sample ID: MB-111109

LIMS ID: 09-27531

Matrix: Water

Data Release Authorized: *[Signature]*

Reported: 11/17/09

QC Report No: PW89-The Boeing Company

Project: Plant 2 Source Control

Event: 013-1646-009.500

Date Sampled: NA

Date Received: NA

Date Extracted: 11/11/09

Date Analyzed: 11/16/09 13:19

Instrument/Analyst: NT2/PK

Sample Amount: 500 mL

Final Extract Volume: 0.5 mL

Dilution Factor: 1.00

| CAS Number | Analyte | RL | Result |
|------------|--------------------------|------|----------|
| 91-20-3 | Naphthalene | 0.10 | < 0.10 U |
| 91-57-6 | 2-Methylnaphthalene | 0.10 | < 0.10 U |
| 90-12-0 | 1-Methylnaphthalene | 0.10 | < 0.10 U |
| 208-96-8 | Acenaphthylene | 0.10 | < 0.10 U |
| 83-32-9 | Acenaphthene | 0.10 | < 0.10 U |
| 86-73-7 | Fluorene | 0.10 | < 0.10 U |
| 85-01-8 | Phenanthrene | 0.10 | < 0.10 U |
| 120-12-7 | Anthracene | 0.10 | < 0.10 U |
| 206-44-0 | Fluoranthene | 0.10 | < 0.10 U |
| 129-00-0 | Pyrene | 0.10 | < 0.10 U |
| 56-55-3 | Benzo (a) anthracene | 0.10 | < 0.10 U |
| 218-01-9 | Chrysene | 0.10 | < 0.10 U |
| 205-99-2 | Benzo (b) fluoranthene | 0.10 | < 0.10 U |
| 207-08-9 | Benzo (k) fluoranthene | 0.10 | < 0.10 U |
| 50-32-8 | Benzo (a) pyrene | 0.10 | < 0.10 U |
| 193-39-5 | Indeno (1,2,3-cd) pyrene | 0.10 | < 0.10 U |
| 53-70-3 | Dibenz (a,h) anthracene | 0.10 | < 0.10 U |
| 191-24-2 | Benzo (g,h,i) perylene | 0.10 | < 0.10 U |
| 132-64-9 | Dibenzofuran | 0.10 | < 0.10 U |

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

| | |
|------------------------------|-------|
| d10-2-Methylnaphthalene | 61.0% |
| d14-Dibenzo (a,h) anthracene | 73.7% |

PCB ANALYSIS

ORGANICS ANALYSIS DATA SHEET

PCB by GC/ECD Method SW8082

Page 1 of 1




Sample ID: PL2SC-EB-110909

SAMPLE

Lab Sample ID: PW89C

LIMS ID: 09-27528

Matrix: Water

Data Release Authorized: 

Reported: 11/20/09

QC Report No: PW89-The Boeing Company

Project: Plant 2 Source Control

013-1646-009.500

Date Sampled: 11/09/09

Date Received: 11/09/09

Date Extracted: 11/11/09

Date Analyzed: 11/17/09 19:16

Instrument/Analyst: ECD5/PK

GPC Cleanup: No

Sulfur Cleanup: No

Sample Amount: 500 mL

Final Extract Volume: 5.0 mL

Dilution Factor: 1.00

Silica Gel: No

Acid Cleanup: No

| CAS Number | Analyte | RL | Result |
|------------|--------------|-----|---------|
| 12674-11-2 | Aroclor 1016 | 1.0 | < 1.0 U |
| 53469-21-9 | Aroclor 1242 | 1.0 | < 1.0 U |
| 12672-29-6 | Aroclor 1248 | 1.0 | < 1.0 U |
| 11097-69-1 | Aroclor 1254 | 1.0 | < 1.0 U |
| 11096-82-5 | Aroclor 1260 | 1.0 | < 1.0 U |
| 11104-28-2 | Aroclor 1221 | 1.0 | < 1.0 U |
| 11141-16-5 | Aroclor 1232 | 1.0 | < 1.0 U |

Reported in $\mu\text{g/L}$ (ppb)

PCB Surrogate Recovery

| | |
|-----------------------|-------|
| Decachlorobiphenyl | 54.8% |
| Tetrachlorometaxylene | 69.0% |

SW8082/PCB WATER SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: PW89-The Boeing Company
Project: Plant 2 Source Control
013-1646-009.500

| Client ID | DCBP % REC | DCBP LCL-UCL | TCMX % REC | TCMX LCL-UCL | TOT | OUT |
|-----------------|---------------|-----------------|---------------|-----------------|-----|-----|
| MB-111109 | 60.2% | 41-111 | 71.0% | 40-118 | | 0 |
| LCS-111109 | 57.0% | 41-111 | 76.8% | 40-118 | | 0 |
| LCSD-111109 | 65.2% | 41-111 | 81.2% | 40-118 | | 0 |
| PL2SC-EB-110909 | 54.8% | 29-118 | 69.0% | 38-118 | | 0 |

Prep Method: SW3510C
Log Number Range: 09-27528 to 09-27528

ORGANICS ANALYSIS DATA SHEET

PCB by GC/ECD Method SW8082

Page 1 of 1

Sample ID: LCS-111109

LCS/LCSD

Lab Sample ID: LCS-111109

LIMS ID: 09-27528

Matrix: Water

Data Release Authorized: *BB*

Reported: 11/20/09

QC Report No: PW89-The Boeing Company

Project: Plant 2 Source Control

013-1646-009.500

Date Sampled: NA

Date Received: NA

Date Extracted LCS/LCSD: 11/11/09

Sample Amount LCS: 500 mL

LCSD: 500 mL

Date Analyzed LCS: 11/17/09 18:33

Final Extract Volume LCS: 5.0 mL

LCSD: 11/17/09 18:55

LCSD: 5.0 mL

Instrument/Analyst LCS: ECD5/PK

Dilution Factor LCS: 1.00

LCSD: ECD5/PK

LCSD: 1.00

GPC Cleanup: No

Silica Gel: No

Sulfur Cleanup: No

Acid Cleanup: No

| Analyte | Spike | | LCS | | Spike | | LCSD | | RPD |
|--------------|-------|-----------|----------|------|------------|----------|----------|------|-----|
| | LCS | Added-LCS | Recovery | LCS | Added-LCSD | Recovery | Recovery | LCSD | |
| Aroclor 1016 | 4.73 | 5.00 | 94.6% | 5.00 | 5.00 | 100% | 5.5% | | |
| Aroclor 1260 | 4.61 | 5.00 | 92.2% | 4.79 | 5.00 | 95.8% | 3.8% | | |

PCB Surrogate Recovery

| | LCS | LCSD |
|-----------------------|-------|-------|
| Decachlorobiphenyl | 57.0% | 65.2% |
| Tetrachlorometaxylene | 76.8% | 81.2% |

Results reported in $\mu\text{g/L}$

RPD calculated using sample concentrations per SW846.

4
PCB METHOD BLANK SUMMARY

BLANK NO.

PW89MBW1

Lab Name: ANALYTICAL RESOURCES, INC

Client: THE BOEING COMPANY

ARI Job No.: PW89

Project: PLANT 2 SOURCE CONTR

Lab Sample ID: PW89MBW1

Lab File ID: 1116B088

Date Extracted: 11/11/09

Matrix: LIQUID

Date Analyzed: 11/17/09

Instrument ID: ECD5

Time Analyzed: 1812

GC Columns: ZB5/ZB35

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

| | CLIENT SAMPLE NO. ===== | LAB SAMPLE ID ===== | DATE ANALYZED ===== |
|----|-------------------------------|---------------------------|---------------------------|
| 01 | PW89LCSW1 | PW89LCSW1 | 11/17/09 |
| 02 | PW89LCSDW1 | PW89LCSDW1 | 11/17/09 |
| 03 | PL2SC-EB-110909 | PW89C | 11/17/09 |

ALL RUNS ARE DUAL COLUMN

ORGANICS ANALYSIS DATA SHEET

PCB by GC/ECD Method SW8082

Page 1 of 1

Sample ID: MB-111109

METHOD BLANK

Lab Sample ID: MB-111109

LIMS ID: 09-27528

Matrix: Water

Data Release Authorized: 

Reported: 11/20/09

QC Report No: PW89-The Boeing Company

Project: Plant 2 Source Control

013-1646-009.500

Date Sampled: NA

Date Received: NA

Date Extracted: 11/11/09

Date Analyzed: 11/17/09 18:12

Instrument/Analyst: ECD5/PK

GPC Cleanup: No

Sulfur Cleanup: No

Sample Amount: 500 mL

Final Extract Volume: 5.0 mL

Dilution Factor: 1.00

Silica Gel: No

Acid Cleanup: No

| CAS Number | Analyte | RL | Result |
|------------|--------------|-----|---------|
| 12674-11-2 | Aroclor 1016 | 1.0 | < 1.0 U |
| 53469-21-9 | Aroclor 1242 | 1.0 | < 1.0 U |
| 12672-29-6 | Aroclor 1248 | 1.0 | < 1.0 U |
| 11097-69-1 | Aroclor 1254 | 1.0 | < 1.0 U |
| 11096-82-5 | Aroclor 1260 | 1.0 | < 1.0 U |
| 11104-28-2 | Aroclor 1221 | 1.0 | < 1.0 U |
| 11141-16-5 | Aroclor 1232 | 1.0 | < 1.0 U |

Reported in $\mu\text{g/L}$ (ppb)

PCB Surrogate Recovery

| | |
|-----------------------|-------|
| Decachlorobiphenyl | 60.2% |
| Tetrachlorometaxylene | 71.0% |

ORGANICS ANALYSIS DATA SHEET

PCB by GC/ECD Method SW8082

Page 1 of 1

Sample ID: PL2SC-4-291BINS-110909

SAMPLE

Lab Sample ID: PW89A

LIMS ID: 09-27526

Matrix: Solid

Data Release Authorized: 

Reported: 11/20/09

QC Report No: PW89-The Boeing Company

Project: Plant 2 Source Control

013-1646-009.500

Date Sampled: 11/09/09

Date Received: 11/09/09

Date Extracted: 11/16/09

Date Analyzed: 11/19/09 01:24

Instrument/Analyst: ECD7/PK

GPC Cleanup: No

Sulfur Cleanup: Yes

Acid Cleanup: Yes

Florisil Cleanup: No

Sample Amount: 10.7 g-dry-wt

Final Extract Volume: 4.0 mL

Dilution Factor: 5.00

Silica Gel: Yes

Percent Moisture: 16.8%

| CAS Number | Analyte | RL | Result |
|------------|--------------|----|--------|
| 12674-11-2 | Aroclor 1016 | 56 | < 56 U |
| 53469-21-9 | Aroclor 1242 | 56 | < 56 U |
| 12672-29-6 | Aroclor 1248 | 56 | < 56 U |
| 11097-69-1 | Aroclor 1254 | 56 | < 56 U |
| 11096-82-5 | Aroclor 1260 | 56 | < 56 U |
| 11104-28-2 | Aroclor 1221 | 56 | < 56 U |
| 11141-16-5 | Aroclor 1232 | 56 | < 56 U |

Reported in $\mu\text{g/kg}$ (ppb)

PCB Surrogate Recovery

| | |
|-----------------------|-------|
| Decachlorobiphenyl | 84.5% |
| Tetrachlorometaxylene | 78.6% |

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082
Page 1 of 1



Sample ID: PL2SC-37-70INS-110909
SAMPLE

Lab Sample ID: PW89B
LIMS ID: 09-27527
Matrix: Solid
Data Release Authorized: *[Signature]*
Reported: 11/20/09

QC Report No: PW89-The Boeing Company
Project: Plant 2 Source Control
013-1646-009.500
Date Sampled: 11/09/09
Date Received: 11/09/09

Date Extracted: 11/16/09
Date Analyzed: 11/19/09 01:48
Instrument/Analyst: ECD7/PK
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 5.83 g-dry-wt
Final Extract Volume: 4.0 mL
Dilution Factor: 5.00
Silica Gel: Yes
Percent Moisture: 51.9%

| CAS Number | Analyte | RL | Result |
|------------|--------------|-----|---------|
| 12674-11-2 | Aroclor 1016 | 100 | < 100 U |
| 53469-21-9 | Aroclor 1242 | 100 | < 100 U |
| 12672-29-6 | Aroclor 1248 | 120 | < 120 Y |
| 11097-69-1 | Aroclor 1254 | 100 | 270 |
| 11096-82-5 | Aroclor 1260 | 100 | 250 |
| 11104-28-2 | Aroclor 1221 | 100 | < 100 U |
| 11141-16-5 | Aroclor 1232 | 100 | < 100 U |

Reported in $\mu\text{g/kg}$ (ppb)

PCB Surrogate Recovery

| | |
|-----------------------|------|
| Decachlorobiphenyl | 116% |
| Tetrachlorometaxylene | 108% |

SW8082/PCB SOIL/SEDIMENT SURROGATE RECOVERY SUMMARY

Matrix: Solid

QC Report No: PW89-The Boeing Company
Project: Plant 2 Source Control
013-1646-009.500

| Client ID | DCBP % REC | DCBP LCL-UCL | TCMX % REC | TCMX LCL-UCL | TOT OUT |
|------------------------|---------------|-----------------|---------------|-----------------|---------|
| MB-111609 | 91.0% | 59-112 | 79.2% | 46-111 | 0 |
| LCS-111609 | 100% | 59-112 | 85.8% | 46-111 | 0 |
| LCSD-111609 | 80.5% | 59-112 | 71.8% | 46-111 | 0 |
| PL2SC-4-291BINS-110909 | 84.5% | 42-127 | 78.6% | 50-114 | 0 |
| PL2SC-37-70INS-110909 | 116% | 42-127 | 108% | 50-114 | 0 |

Standard Sonication Control Limits
Prep Method: SW3550B
Log Number Range: 09-27526 to 09-27527

ORGANICS ANALYSIS DATA SHEET

PCB by GC/ECD Method SW8082

Page 1 of 1

Sample ID: LCS-111609

LCS/LCSD

Lab Sample ID: LCS-111609

LIMS ID: 09-27526

Matrix: Solid

Data Release Authorized: *GR*

Reported: 11/20/09

QC Report No: PW89-The Boeing Company

Project: Plant 2 Source Control

013-1646-009.500

Date Sampled: NA

Date Received: NA

Date Extracted LCS/LCSD: 11/16/09

Sample Amount LCS: 12.0 g-dry-wt

LCSD: 12.0 g-dry-wt

Date Analyzed LCS: 11/18/09 17:30

Final Extract Volume LCS: 4.0 mL

LCSD: 11/18/09 17:54

LCSD: 4.0 mL

Instrument/Analyst LCS: ECD7/PK

Dilution Factor LCS: 1.00

LCSD: ECD7/PK

LCSD: 1.00

GPC Cleanup: No

Silica Gel: Yes

Sulfur Cleanup: Yes

Percent Moisture: NA

Acid Cleanup: Yes

Florisil Cleanup: No

| Analyte | LCS | Spike Added-LCS | LCS Recovery | LCSD | Spike Added-LCSD | LCSD Recovery | RPD |
|--------------|-----|--------------------|-----------------|------|---------------------|------------------|-------|
| Aroclor 1016 | 192 | 167 | 115% | 165 | 167 | 99.0% | 15.1% |
| Aroclor 1260 | 182 | 167 | 109% | 144 | 167 | 86.4% | 23.3% |

PCB Surrogate Recovery

| | LCS | LCSD |
|-----------------------|-------|-------|
| Decachlorobiphenyl | 100% | 80.5% |
| Tetrachlorometaxylene | 85.8% | 71.8% |

Results reported in $\mu\text{g/kg}$ (ppb)

RPD calculated using sample concentrations per SW846.

4
PCB METHOD BLANK SUMMARY

BLANK NO.

PW89MBS1

Lab Name: ANALYTICAL RESOURCES, INC

Client: THE BOEING COMPANY

ARI Job No.: PW89

Project: PLANT 2 SOURCE CONTR

Lab Sample ID: PW89MBS1

Lab File ID: 1118A025

Date Extracted: 11/16/09

Matrix: SOLID

Date Analyzed: 11/18/09

Instrument ID: ECD7

Time Analyzed: 1707

GC Columns: ZB5/ZB35

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

| | CLIENT SAMPLE NO. ===== | LAB SAMPLE ID ===== | DATE ANALYZED ===== |
|----|-------------------------------|---------------------------|---------------------------|
| 01 | PW89LCSS1 | PW89LCSS1 | 11/18/09 |
| 02 | PW89LCSDS1 | PW89LCSDS1 | 11/18/09 |
| 03 | PL2SC-4-291BINS-110 | PW89A | 11/18/09 |
| 04 | PL2SC-37-70INS-1109 | PW89B | 11/18/09 |

ALL RUNS ARE DUAL COLUMN

ORGANICS ANALYSIS DATA SHEET

PCB by GC/ECD Method SW8082

Page 1 of 1

Sample ID: MB-111609

METHOD BLANK

Lab Sample ID: MB-111609

LIMS ID: 09-27526

Matrix: Solid

Data Release Authorized: *[Signature]*

Reported: 11/20/09

QC Report No: PW89-The Boeing Company

Project: Plant 2 Source Control

013-1646-009.500

Date Sampled: NA

Date Received: NA

Date Extracted: 11/16/09

Date Analyzed: 11/18/09 17:07

Instrument/Analyst: ECD7/PK

GPC Cleanup: No

Sulfur Cleanup: Yes

Acid Cleanup: Yes

Florisil Cleanup: No

Sample Amount: 12.0 g

Final Extract Volume: 4.0 mL

Dilution Factor: 1.00

Silica Gel: Yes

Percent Moisture: NA

| CAS Number | Analyte | RL | Result |
|------------|--------------|----|--------|
| 12674-11-2 | Aroclor 1016 | 10 | < 10 U |
| 53469-21-9 | Aroclor 1242 | 10 | < 10 U |
| 12672-29-6 | Aroclor 1248 | 10 | < 10 U |
| 11097-69-1 | Aroclor 1254 | 10 | < 10 U |
| 11096-82-5 | Aroclor 1260 | 10 | < 10 U |
| 11104-28-2 | Aroclor 1221 | 10 | < 10 U |
| 11141-16-5 | Aroclor 1232 | 10 | < 10 U |

Reported in $\mu\text{g/kg}$ (ppb)

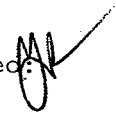
PCB Surrogate Recovery

| | |
|-----------------------|-------|
| Decachlorobiphenyl | 91.0% |
| Tetrachlorometaxylene | 79.2% |

METALS ANALYSIS

INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS
Page 1 of 1

Sample ID: PL2SC-W-V-110909
SAMPLE

Lab Sample ID: PW89D
LIMS ID: 09-27529
Matrix: Water
Data Release Authorized: 
Reported: 11/19/09

QC Report No: PW89-The Boeing Company
Project: Plant 2 Source Control
013-1646-009.500
Date Sampled: 11/09/09
Date Received: 11/09/09

| Prep Meth | Prep Date | Analysis Method | Analysis Date | CAS Number | Analyte | RL | µg/L | Q |
|-----------|-----------|-----------------|---------------|------------|----------|-----|------|---|
| 200.8 | 11/11/09 | 200.8 | 11/18/09 | 7440-38-2 | Arsenic | 0.5 | 1.3 | |
| 6010B | 11/11/09 | 6010B | 11/17/09 | 7440-43-9 | Cadmium | 2 | 2 | U |
| 6010B | 11/11/09 | 6010B | 11/17/09 | 7440-47-3 | Chromium | 5 | 5 | U |
| 6010B | 11/11/09 | 6010B | 11/17/09 | 7440-50-8 | Copper | 2 | 2 | U |
| 200.8 | 11/11/09 | 200.8 | 11/18/09 | 7439-92-1 | Lead | 1 | 1 | U |
| 6010B | 11/11/09 | 6010B | 11/17/09 | 7440-22-4 | Silver | 3 | 3 | U |
| 6010B | 11/11/09 | 6010B | 11/17/09 | 7440-66-6 | Zinc | 10 | 40 | |

U-Analyte undetected at given RL
RL-Reporting Limit

INORGANICS ANALYSIS DATA SHEET

DISSOLVED METALS

Page 1 of 1

Sample ID: PL2SC-W-V-110909

DUPLICATE

Lab Sample ID: PW89D

LIMS ID: 09-27529

Matrix: Water

Data Release Authorized: *[Signature]*

Reported: 11/19/09

QC Report No: PW89-The Boeing Company

Project: Plant 2 Source Control

013-1646-009.500

Date Sampled: 11/09/09

Date Received: 11/09/09

MATRIX DUPLICATE QUALITY CONTROL REPORT

| Analyte | Analysis Method | Sample | Duplicate | RPD | Control Limit | Q |
|----------|-----------------|--------|-----------|------|---------------|---|
| Arsenic | 200.8 | 1.3 | 1.2 | 8.0% | +/- 0.5 | L |
| Cadmium | 6010B | 2 U | 2 U | 0.0% | +/- 2 | L |
| Chromium | 6010B | 5 U | 5 U | 0.0% | +/- 5 | L |
| Copper | 6010B | 2 U | 2 | 0.0% | +/- 2 | L |
| Lead | 200.8 | 1 U | 1 U | 0.0% | +/- 1 | L |
| Silver | 6010B | 3 U | 3 U | 0.0% | +/- 3 | L |
| Zinc | 6010B | 40 | 40 | 0.0% | +/- 10 | L |

Reported in µg/L

*-Control Limit Not Met

L-RPD Invalid, Limit = Detection Limit

INORGANICS ANALYSIS DATA SHEET

DISSOLVED METALS

Page 1 of 1

Sample ID: PL2SC-W-V-110909

MATRIX SPIKE

Lab Sample ID: PW89D

LIMS ID: 09-27529

Matrix: Water

Data Release Authorized: *[Signature]*

Reported: 11/19/09

QC Report No: PW89-The Boeing Company

Project: Plant 2 Source Control

013-1646-009.500

Date Sampled: 11/09/09

Date Received: 11/09/09

MATRIX SPIKE QUALITY CONTROL REPORT

| Analyte | Analysis Method | Sample | Spike | Spike Added | % Recovery | Q |
|----------|-----------------|--------|-------|-------------|------------|---|
| Arsenic | 200.8 | 1.32 | 26.1 | 25.0 | 99.1% | |
| Cadmium | 6010B | 2.00 U | 573 | 500 | 115% | |
| Chromium | 6010B | 5.00 U | 546 | 500 | 109% | |
| Copper | 6010B | 2.00 U | 542 | 500 | 108% | |
| Lead | 200.8 | 1.00 U | 22.8 | 25.0 | 91.2% | |
| Silver | 6010B | 3.00 U | 426 | 500 | 85.2% | |
| Zinc | 6010B | 38.4 | 559 | 500 | 104% | |

Reported in µg/L

N-Control Limit Not Met

H-% Recovery Not Applicable, Sample Concentration Too High

NA-Not Applicable, Analyte Not Spiked

Percent Recovery Limits: 75-125%

INORGANICS ANALYSIS DATA SHEET

DISSOLVED METALS

Page 1 of 1


Sample ID: PL2SC-W-DUP-110909

SAMPLE

Lab Sample ID: PW89E

LIMS ID: 09-27530

Matrix: Water

Data Release Authorized: 

Reported: 11/19/09

QC Report No: PW89-The Boeing Company

Project: Plant 2 Source Control

013-1646-009.500

Date Sampled: 11/09/09

Date Received: 11/09/09

| Prep Meth | Prep Date | Analysis Method | Analysis Date | CAS Number | Analyte | RL | µg/L | Q |
|-----------|-----------|-----------------|---------------|------------|----------|-----|------|---|
| 200.8 | 11/11/09 | 200.8 | 11/18/09 | 7440-38-2 | Arsenic | 0.5 | 1.2 | |
| 6010B | 11/11/09 | 6010B | 11/17/09 | 7440-43-9 | Cadmium | 2 | 2 | U |
| 6010B | 11/11/09 | 6010B | 11/17/09 | 7440-47-3 | Chromium | 5 | 5 | U |
| 6010B | 11/11/09 | 6010B | 11/17/09 | 7440-50-8 | Copper | 2 | 2 | |
| 200.8 | 11/11/09 | 200.8 | 11/18/09 | 7439-92-1 | Lead | 1 | 1 | U |
| 6010B | 11/11/09 | 6010B | 11/17/09 | 7440-22-4 | Silver | 3 | 3 | U |
| 6010B | 11/11/09 | 6010B | 11/17/09 | 7440-66-6 | Zinc | 10 | 40 | |

U-Analyte undetected at given RL

RL-Reporting Limit

INORGANICS ANALYSIS DATA SHEET

DISSOLVED METALS

Page 1 of 1

Sample ID: METHOD BLANK

Lab Sample ID: PW89MB

LIMS ID: 09-27530

Matrix: Water

Data Release Authorized

Reported: 11/19/09

QC Report No: PW89-The Boeing Company

Project: Plant 2 Source Control

013-1646-009.500

Date Sampled: NA

Date Received: NA

| Prep Meth | Prep Date | Analysis Method | Analysis Date | CAS Number | Analyte | RL | µg/L | Q |
|-----------|-----------|-----------------|---------------|------------|----------|-----|------|---|
| 200.8 | 11/11/09 | 200.8 | 11/18/09 | 7440-38-2 | Arsenic | 0.2 | 0.2 | U |
| 6010B | 11/11/09 | 6010B | 11/17/09 | 7440-43-9 | Cadmium | 2 | 2 | U |
| 6010B | 11/11/09 | 6010B | 11/17/09 | 7440-47-3 | Chromium | 5 | 5 | U |
| 6010B | 11/11/09 | 6010B | 11/17/09 | 7440-50-8 | Copper | 2 | 2 | U |
| 200.8 | 11/11/09 | 200.8 | 11/18/09 | 7439-92-1 | Lead | 1 | 1 | U |
| 6010B | 11/11/09 | 6010B | 11/17/09 | 7440-22-4 | Silver | 3 | 3 | U |
| 6010B | 11/11/09 | 6010B | 11/17/09 | 7440-66-6 | Zinc | 10 | 10 | U |

U-Analyte undetected at given RL

RL-Reporting Limit

INORGANICS ANALYSIS DATA SHEET

DISSOLVED METALS


Page 1 of 1

Sample ID: LAB CONTROL

Lab Sample ID: PW89LCS

LIMS ID: 09-27530

Matrix: Water

Data Release Authorized: 

Reported: 11/19/09

QC Report No: PW89-The Boeing Company

Project: Plant 2 Source Control

013-1646-009.500

Date Sampled: NA

Date Received: NA

BLANK SPIKE QUALITY CONTROL REPORT

| Analyte | Analysis Method | Spike Found | Spike Added | % Recovery | Q |
|----------|-----------------|-------------|-------------|------------|---|
| Arsenic | 200.8 | 26.3 | 25.0 | 105% | |
| Cadmium | 6010B | 566 | 500 | 113% | |
| Chromium | 6010B | 540 | 500 | 108% | |
| Copper | 6010B | 515 | 500 | 103% | |
| Lead | 200.8 | 24 | 25 | 96.0% | |
| Silver | 6010B | 458 | 500 | 91.6% | |
| Zinc | 6010B | 520 | 500 | 104% | |

Reported in µg/L


N-Control limit not met

Control Limits: 80-120%

MERCURY ANALYSIS

INORGANICS ANALYSIS DATA SHEET
Dissolved Mercury by Method SW7470A



Data Release Authorized 
Reported: 11/13/09
Date Received: 11/09/09
Page 1 of 1

QC Report No: PW88-The Boeing Company
Project: Plant 2 Source Control
013-1646-009.500

| Client/ ARI ID | Date Sampled | Matrix | Prep Date Anal Date | RL | Result |
|--------------------------------------|-----------------|--------|------------------------|------|--------|
| PL2SC-W-V-110909 PW88A 09-27524 | 11/09/09 | Water | 11/11/09 11/12/09 | 20.0 | 20.0 U |
| PL2SC-W-DUP-110909 PW88B 09-27525 | 11/09/09 | Water | 11/11/09 11/12/09 | 20.0 | 20.0 U |
| MB-111109 Method Blank | NA | Water | 11/11/09 11/12/09 | 20.0 | 20.0 U |

Reported in ng/L

RL-Analytical reporting limit
U-Undetected at reported detection limit

INORGANICS ANALYSIS DATA SHEET

DISSOLVED METALS

Page 1 of 1

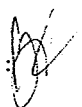
Sample ID: PL2SC-W-V-110909

MATRIX SPIKE

Lab Sample ID: PW88A

LIMS ID: 09-27524

Matrix: Water

Data Release Authorized: 

Reported: 11/13/09

QC Report No: PW88-The Boeing Company

Project: Plant 2 Source Control

013-1646-009.500

Date Sampled: 11/09/09

Date Received: 11/09/09

MATRIX SPIKE QUALITY CONTROL REPORT

| Analyte | Analysis Method | Sample | Spike | Spike Added | % Recovery | Q |
|---------|-----------------|--------|-------|-------------|------------|---|
| Mercury | 7470A | 20.0 U | 89.6 | 100 | 89.6% | |

Reported in ng/L

N-Control Limit Not Met

H-% Recovery Not Applicable, Sample Concentration Too High

NA-Not Applicable, Analyte Not Spiked

Percent Recovery Limits: 75-125%

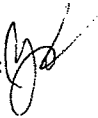
INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS
Page 1 of 1

Sample ID: PL2SC-W-V-110909
DUPLICATE

Lab Sample ID: PW88A

LIMS ID: 09-27524

Matrix: Water

Data Release Authorized: 

Reported: 11/13/09

QC Report No: PW88-The Boeing Company

Project: Plant 2 Source Control

013-1646-009.500

Date Sampled: 11/09/09

Date Received: 11/09/09

MATRIX DUPLICATE QUALITY CONTROL REPORT

| Analyte | Analysis Method | Sample | Duplicate | RPD | Control Limit | Q |
|---------|-----------------|--------|-----------|------|---------------|---|
| Mercury | 7470A | 20.0 U | 20.0 U | 0.0% | +/- 20.0 | L |

Reported in ng/L

*-Control Limit Not Met

L-RPD Invalid, Limit = Detection Limit


INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS
Page 1 of 1

Sample ID: LAB CONTROL

Lab Sample ID: PW88LCS

LIMS ID: 09-27525

Matrix: Water

Data Release Authorized: 

Reported: 11/13/09

QC Report No: PW88-The Boeing Company

Project: Plant 2 Source Control

013-1646-009.500

Date Sampled: NA

Date Received: NA

BLANK SPIKE QUALITY CONTROL REPORT

| Analyte | Analysis Method | Spike Found | Spike Added | % Recovery | Q |
|---------|-----------------|-------------|-------------|------------|---|
| Mercury | 7470A | 165 | 200 | 82.5% | |

Reported in ng/L

N-Control limit not met

Control Limits: 80-120%

TOTAL SOLIDS

Extractions Total Solids-extts
Data By: Jim Hawk
Created: 11/11/09

Worklist: 877
Analyst: RVR
Comments:

| | ARI ID CLIENT ID | Tare Wt (g) | Wet Wt (g) | Dry Wt (g) | % Solids | pH |
|----|---|----------------|---------------|---------------|----------|----|
| 1. | PW89A 09-27526 PL2SC-4-291BINS-110909 | 1.19 | 13.09 | 11.09 | 83.2 | NR |
| 2. | PW89B 09-27527 PL2SC-37-70INS-110909 | 1.16 | 11.84 | 6.30 | 48.1 | NR |

Extractions Total Solids-extts
Data By: Jim Hawk
Created: 11/11/09

Worklist: 877
Analyst: JBH
Comments:

| ARI ID CLIENT ID | Tare Wt (g) | Wet Wt (g) | Dry Wt (g) | % Solids | pH |
|--|----------------|---------------|---------------|----------|----|
| 1. PW89A 09-27526 PL2SC-4-291BINS-110909 | 1.19 | 13.09 | | 11.09 | NR |
| 2. PW89B 09-27527 PL2SC-37-70INS-110909 | 1.16 | 11.84 | | 6.30 | NR |



Analytical Resources, Incorporated
Analytical Chemists and Consultants

November 23, 2009

Will Ernst
The Boeing Company
Energy and Environmental Affairs
P.O. Box 3707, M/S 7A-WH
Seattle, WA 98124-2207

RE: Boeing Plant 2 Source Control
ARI ID: PX30 & PX33

Dear Will:

Please find enclosed the original *Chain of Custody* (COC) record and final data package for the project referenced above.

Sample receipt information and analytical details are addressed in the *Case Narrative*.

Copies of the reports and all associated raw data will be kept on file at ARI. If you have any questions or require additional information, please contact me at your convenience.

Sincerely,
ANALYTICAL RESOURCES, INC.

Kelly Bottem
Client Services Manager
(206) 695-6211
kellyb@arilabs.com

KB/kb

Enclosures

cc: Kent Angelos, Golder Associates Inc., 18300 NE Union Hill Road, Suite 200, Redmond, WA 98052-3333

Chain of Custody
Documentation

prepared
for

The Boeing Company
Project: BP2 SOURCE CONTROL

ARI JOB NO: PX30, PX33

prepared
by

Analytical Resources, Inc.

Analytical Resources, Incorporated
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)



| | |
|-------------------|-------------------|
| Page: 1 | of 1 |
| Date: 11/12/09 | Ice Present? Y |
| No. of Coolers: 1 | Cooler Temps: 9.5 |

| | |
|----------------------|-------------------------|
| ARI Assigned Number: | Turn-around Requested: |
| | Std |
| ARI Client Company: | Phone: |
| Boeing | |
| Client Contact: | |
| Will Ernst | |
| Client Project Name: | |
| BPD Source Control | |
| Client Project #: | Samplers: |
| | Liz Shear, Jill Lambert |

| Sample ID | Date | Time | Matrix | No. Containers |
|-------------------------------|--|---|--------|----------------|
| PL2SC-W-EB1-111209 | 11/12/09 | 1030 | W | 4 |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| Comments/Special Instructions | Relinquished by: (Signature) <i>Charles R. Khan</i> | Received by: (Signature) <i>A. V. V.</i> | | |
| | Printed Name: <i>Liz Stea</i> | Printed Name: <i>A. V. V.</i> | | |
| | Company: <i>Golden</i> | Company: <i>AR</i> | | |
| | Date & Time: <i>11/12/09 1315</i> | Date & Time: <i>11/12</i> | | |

Limits of Liability: ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, notwithstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.



ARI Job No: PX33

PC: Kelly
VTSR: 11/12/09

Inquiry Number: NONE
Analysis Requested: 11/12/09
Contact: Ernst, Will
Client: The Boeing Company
Logged by: MM
Sample Set Used: Yes-481
Validatable Package: No
Deliverables:

Project #:
Project: BP2 SOURCE CONTROL
Sample Site:
SDG No:
Analytical Protocol: In-house

| LOGNUM ARI ID | CLIENT ID | CN | WAD | NH3 | COD | FOG | MET | PHEN | PHOS | TKN | NO23 | TOC | S2 | AK102 | Fe2+ | DMET DOC | ADJUSTED | LOT | AMOUNT | DATE/BY |
|-------------------|--------------------|-----|-----|-----|-----|-----|-----|------|------|-----|------|-----|----|-------|------|----------|----------|--------|--------|---------|
| | | | | | | | | | | | | | | | | FLT | TO | NUMBER | ADDED | |
| 09-27920 PX33A | PL2SC-W-EB1-111209 | >12 | >12 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | >9 | <2 | <2 | Y | | | | |

DIS

Checked By

MMW

Date

11/12/09



Analytical Resources,
Incorporated
Analytical Chemists and
Consultants

Cooler Receipt Form

ARI Client: Boeing

COC No(s): _____ (NA)

Assigned ARI Job No: PX33

Project Name: BP2 Source Control

Delivered by: Fed-Ex UPS Courier Hand Delivered Other: _____

Tracking No: _____ (NA)

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to cooler? YES (NO)

Were custody papers included with the cooler? (YES) NO

Were custody papers properly filled out (ink, signed, etc.) (YES) NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry)..... 9.5

If cooler temperature is out of compliance fill out form 00070F

Temp Gun ID#: 90877952

Cooler Accepted by: AV Date: 11/12/09 Time: 1315

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler? YES (NO)

What kind of packing material was used? ... Bubble Wrap Wet Ice Gel Packs Baggies Foam Block Paper Other: _____

Was sufficient ice used (if appropriate)? NA (YES) NO

Were all bottles sealed in individual plastic bags? YES (NO)

Did all bottles arrive in good condition (unbroken)? (YES) NO

Were all bottle labels complete and legible? (YES) NO

Did the number of containers listed on COC match with the number of containers received? (YES) NO

Did all bottle labels and tags agree with custody papers? (YES) NO

Were all bottles used correct for the requested analyses? (YES) NO

Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)... NA (YES) NO

Were all VOC vials free of air bubbles? (NA) YES NO

Was sufficient amount of sample sent in each bottle? (YES) NO

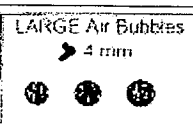
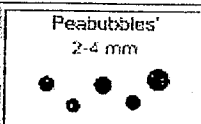
Samples Logged by: MM Date: 11/12/09 Time: 1450

**** Notify Project Manager of discrepancies or concerns ****

| Sample ID on Bottle | Sample ID on COC | Sample ID on Bottle | Sample ID on COC |
|---------------------|------------------|---------------------|------------------|
| | | | |
| | | | |
| | | | |
| | | | |

Additional Notes, Discrepancies, & Resolutions:

By: _____ Date: _____



Small → "sm"

Peabubbles → "pb"

Large → "lg"

Headspace → "hs"



ARI Job No: PX30

PC: Kelly
VTSR: 11/12/09Project #:
Project: BP2 Source Control
Sample Site:
SDG No:
Analytical Protocol: In-houseInquiry Number: NONE
Analysis Requested: 11/12/09
Contact: Ernst, Will
Client: The Boeing Company
Logged by: JP
Sample Set Used: Yes-481
Validatable Package: No
Deliverables:

| LOGNUM | CLIENT ID | CN | WAD | NH3 | COD | FOG | MET | PHEN | PHOS | TKN | NO23 | TOC | S2 | AK102 | Fe2+ | DMET DOC | FLT | FLT | PARAMETER | ADJUSTED TO | LOT NUMBER | AMOUNT ADDED | DATE/BY |
|----------|--------------------|-----|-----|-----|-----|-----|-----|------|------|-----|------|-----|----|-------|------|----------|-----|-----|-----------|-------------|------------|--------------|---------|
| 09-27891 | | >12 | >12 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | >9 | <2 | <2 | <2 | Y | | | | | | |
| PX30A | PL2SC-W-EB1-111209 | | | | | | DIS | | | | | | | | | | | | | | | | |

Checked By JP Date 11/12/09



Analytical Resources,
Incorporated
Analytical Chemists and
Consultants

Cooler Receipt Form

ARI Client: Boeing

COC No(s): _____ (NA)

Assigned ARI Job No: PX30

Project Name: BP2 Source Control

Delivered by: Fed-Ex UPS Courier Hand Delivered Other: _____

Tracking No: _____ (NA)

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to cooler? _____

YES (NO)

Were custody papers included with the cooler? _____

(YES) NO

Were custody papers properly filled out (ink, signed, etc.) _____

(YES) NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry)..... 9.5

If cooler temperature is out of compliance fill out form 00070F

Temp Gun ID#: 90877952

Cooler Accepted by: AV Date: 11/12/09 Time: 1315

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler? _____

YES (NO)

What kind of packing material was used? ... Bubble Wrap (Wet Ice) Gel Packs Baggies Foam Block Paper Other: _____

Was sufficient ice used (if appropriate)? _____

NA YES (NO)

Were all bottles sealed in individual plastic bags? _____

YES (NO)

Did all bottles arrive in good condition (unbroken)? _____

(YES) NO

Were all bottle labels complete and legible? _____

(YES) NO

Did the number of containers listed on COC match with the number of containers received? _____

(YES) NO

Did all bottle labels and tags agree with custody papers? _____

(YES) NO

Were all bottles used correct for the requested analyses? _____

(YES) NO

Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)...

NA (YES) NO

Were all VOC vials free of air bubbles? _____

(NA) YES NO

Was sufficient amount of sample sent in each bottle? _____

(YES) NO

Samples Logged by: JP Date: 11/12/09 Time: 1435

**** Notify Project Manager of discrepancies or concerns ****

| Sample ID on Bottle | Sample ID on COC | Sample ID on Bottle | Sample ID on COC |
|---------------------|------------------|---------------------|------------------|
| | | | |
| | | | |
| | | | |
| | | | |

Additional Notes, Discrepancies, & Resolutions:

By: _____

Date: _____



Peabubbles
2-4 mm



LARGE Air Bubbles
4 mm

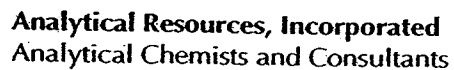


Small → "sm"

Peabubbles → "pb"

Large → "lg"

Headspace → "hs"



Cooler Temperature Compliance Form

Completed by: _____ Date: _____ Time: _____

Case Narrative

prepared
for

The Boeing Company

Project: BP2 SOURCE CONTROL

ARI JOB NO: PX30, PX33

prepared
by

Analytical Resources, Inc.



Case Narrative

Project: Boeing Plant 2 Source Control

ARI IDs: PX30 & PX33

Matrix: Water

Date: November 23, 2009

Sample Receipt Information

One water sample was received in good condition at Analytical Resources, Inc. (ARI) on November 12, 2009 under ARI sample delivery groups (SDGs) PX30 and PX33. The cooler temperature, as measured by IR thermometer, was 9.5°C. For further details regarding sample receipt, please refer to the enclosed Cooler Receipt Form and Preservation Verification sheet.

The sample was analyzed for the parameters listed below, as requested on the Chain of Custody.

PCBs by Method 8082:

The sample was extracted on 11/16/09 and analyzed on 11/7/09 within the method recommended holding times.

Initial calibration (s): All analytes of interest were within method acceptance criteria.

Continuing calibration (s): Are in control.

Samples: There were no anomalies associated with these samples.

Surrogates: All surrogate recoveries were in control.

LCS(s): All percent recoveries for the analytes of interest were within compliance.

Method Blank: The method blank was free of contamination.

Dissolved Metals by Methods 6010B and 200.8 series

The samples were digested on 11/12/09. The digests were analyzed between 11/17/09 and 11/18/09 within the method recommended holding times.

Replicate and Matrix spike(s): All percent recoveries and RPDs were within compliance.

Samples: No anomalies were encountered for these samples.

LCS/Blank Spike(s): All percent recoveries were within compliance.

Method Blank(s): Are in control.



Case Narrative

Project: Boeing Plant 2 Source Control

ARI IDs: PX30 & PX33

Matrix: Water

Date: November 23, 2009

Dissolved Low-Level Mercury by Method SW7470A

The samples were digested on 11/12/09. The digests were analyzed between 11/13/09 and 11/19/09 within the method recommended holding times.

Replicate and Matrix spike(s): All percent recoveries and RPDs were within compliance.

Samples: No anomalies were encountered for these samples.

LCS/Blank Spike(s): All percent recoveries were within compliance.

Method Blank(s): Are in control.



Data Reporting Qualifiers

Effective 7/10/2009

Inorganic Data

- U Indicates that the target analyte was not detected at the reported concentration
- * Duplicate RPD is not within established control limits
- B Reported value is less than the CRDL but \geq the Reporting Limit
- N Matrix Spike recovery not within established control limits
- NA Not Applicable, analyte not spiked
- H The natural concentration of the spiked element is so much greater than the concentration spiked that an accurate determination of spike recovery is not possible
- L Analyte concentration is ≤ 5 times the Reporting Limit and the replicate control limit defaults to ± 1 RL instead of the normal 20% RPD

Organic Data

- U Indicates that the target analyte was not detected at the reported concentration
- * Flagged value is not within established control limits
- B Analyte detected in an associated Method Blank at a concentration greater than one-half of ARI's Reporting Limit or 5% of the regulatory limit or 5% of the analyte concentration in the sample.
- J Estimated concentration when the value is less than ARI's established reporting limits
- D The spiked compound was not detected due to sample extract dilution
- E Estimated concentration calculated for an analyte response above the valid instrument calibration range. A dilution is required to obtain an accurate quantification of the analyte.
- Q Indicates a detected analyte with an initial or continuing calibration that does not meet established acceptance criteria ($<20\%$ RSD, $<20\%$ Drift or minimum RRF).
- S Indicates an analyte response that has saturated the detector. The calculated concentration is not valid; a dilution is required to obtain valid quantification of the analyte



- NA The flagged analyte was not analyzed for
- NR Spiked compound recovery is not reported due to chromatographic interference
- NS The flagged analyte was not spiked into the sample
- M Estimated value for an analyte detected and confirmed by an analyst but with low spectral match parameters. This flag is used only for GC-MS analyses
- M2 The sample contains PCB congeners that do not match any standard Aroclor pattern. The PCBs are identified and quantified as the Aroclor whose pattern most closely matches that of the sample. The reported value is an estimate.
- N The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification"
- Y The analyte is not detected at or above the reported concentration. The reporting limit is raised due to chromatographic interference. The Y flag is equivalent to the U flag with a raised reporting limit.
- C The analyte was positively identified on only one of two chromatographic columns. Chromatographic interference prevented a positive identification on the second column
- P The analyte was detected on both chromatographic columns but the quantified values differ by $\geq 40\%$ RPD with no obvious chromatographic interference

Geotechnical Data

- A The total of all fines fractions. This flag is used to report total fines when only sieve analysis is requested and balances total grain size with sample weight.
- F Samples were frozen prior to particle size determination
- SM Sample matrix was not appropriate for the requested analysis. This normally refers to samples contaminated with an organic product that interferes with the sieving process and/or moisture content, porosity and saturation calculations
- SS Sample did not contain the proportion of "fines" required to perform the pipette portion of the grain size analysis
- W Weight of sample in some pipette aliquots was below the level required for accurate weighting

LCS SOLUTIONS

10/14/2009

| LABL | SOLN ID | TEST | CONC. UG/ML | SOLVENT | EXP. |
|------|---------|--------------|-------------|---------|----------|
| 1 | 1642-1 | PCB | 20 | ACETONE | 09/05/10 |
| 2# | 1472-3 | BCOC PEST | 10 | ACETONE | NA |
| 3 | 1620-4 | PEST | 02/04/20 | ACETONE | 06/26/10 |
| 4 | 1594-2 | LOW PEST | 0.2/0.4/2 | ACETONE | 09/23/09 |
| 5 | 1580-2 | EPH | 1500 | MECL2 | 01/29/10 |
| 6 | 1655-3 | PCP | 12.5/125 | ACETONE | 09/24/10 |
| 7 | 1635-1 | ABN | 100 | ACETONE | 02/01/10 |
| 8 | 1566-1 | TBT | 2.5 | MECL2 | 12/04/09 |
| 9 | 1567-3 | PORE TBT | .125/.25 | MECL2 | 12/04/09 |
| 10 | 1621-4 | ABN ACID | 100/200 | MEOH | 07/14/10 |
| 11 | 1642-2 | TPHD | 15000 | ACETONE | 09/07/10 |
| 12 | 1622-2 | ABN BASE | 200 | ACETONE | 02/05/10 |
| 13 | 1613-1 | LOW PCB | 2 | ACETONE | 06/08/10 |
| 14* | 1547-1 | LOW ABN ACID | 10/20 | MEOH | 04/10/10 |
| 15* | 1591-3 | SIM PNA | 15/75 | MEOH | 08/28/10 |
| 16 | 1602-3 | DIOXANE | 100 | MEOH | 03/20/10 |
| 17 | 1644-1 | 1248 PCB | 10 | ACETONE | 09/10/10 |
| 18* | 1591-4 | LOW SIM PNA | 1.5 | ACETONE | 08/28/10 |
| 19 | 1574-4 | AK103 | 7500 | MECL2 | 12/02/09 |
| 20 | 1572-2 | PNA | 100 | ACETONE | 12/26/09 |
| 21 | 1593-3 | SKY/BHT | 100 | MEOH | 03/31/10 |
| 22 | 1631-1 | HERB | 12.5/12500 | MEOH | 02/19/10 |
| 23* | 1505-1 | LW ABN BASE | 20 | MEOH | 03/20/10 |
| 24 | 1613-2 | LOW ABN | 10 | ACETONE | 02/28/10 |
| 25# | 1481-1 | DIPHENYL | 100 | MEOH | NA |
| 26* | 1545-2 | OP-PEST | 25 | MEOH | 02/16/10 |
| 27# | 1495-1 | STEROLS | 200 | MEOH | NA |
| 28# | 1595-1 | ADD. PEST | 4 | ACETONE | NA |
| 29# | 1496-3 | DECANES | 100 | MEOH | NA |
| 30 | 1620-1 | EDB/DBCP | 0.2 | MEOH | 06/22/10 |
| 31 | 1596-1 | TERPINEOL | 100 | MEOH | 04/03/10 |

LCS SOLUTIONS

10/14/2009

| | | | | | |
|----|-----------------------------|-------------|--------|---------|----------|
| 32 | 1619-3 | GUAIACOL | 50-200 | ACETONE | 04/30/10 |
| 33 | 1639-3 | RETENE | 100 | MEOH | 09/03/10 |
| 34 | 1633-1 | CONGENERS | 2.5 | ACETONE | 08/11/10 |
| 35 | 1601-2 | ALKYL PNA A | 10 | MEOH | 04/03/10 |
| 36 | 1601-3 | ALKYL PNA B | 10 | MEOH | 05/13/10 |
| 50 | 1617-1 | FULL RESIN | 250 | ACETONE | 06/17/10 |
| 51 | 1611-3 | DDTS | 2.5 | ACETONE | 06/04/10 |
| 52 | 1613-5 | 1232 PCB | 20 | ACETONE | 06/16/10 |
| | | | | | |
| | *=REVERIFIED SOLUTION | | | | |
| | #=PROJECT SPECIFIC SOLUTION | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

SURR SOLUTIONS

10/14/2009

| LABEL | SOLN ID | TEST | CONC. UG/ML | SOLVENT | EXP. |
|----------------------|---------|------------|-------------|---------|----------|
| A | 1662-3 | ABN | 100/150 | MEOH | 10/08/10 |
| B | 1633-3 | SIM PNA | 15/75 | MEOH | 08/12/10 |
| C* | 1559-1 | SIM ABN | 25/37.5 | MEOH | 03/13/10 |
| D | 1635-2 | LOW PCB | 0.2 | ACETONE | 05/29/10 |
| E | 1661-2 | HERB | 62.5 | MEOH | 10/02/10 |
| F | 1574-3 | PCP | 12.5 | ACETONE | 01/06/10 |
| G* | 1534-1 | 1,4DIOXANE | 100 | MEOH | 02/20/10 |
| H | 1594-1 | OP-PEST | 25 | MEOH | 04/01/10 |
| I | 1634-1 | LOW S. PNA | 1.5 | MEOH | 08/12/10 |
| J | 1566-5 | TBT-PORE | 0.125 | MECL2 | 12/04/09 |
| K | 1612-1 | MED PCB | 20 | ACETONE | 05/29/10 |
| L | 1584-4 | TBT | 2.5 | MECL2 | 12/04/09 |
| M | 1578-1 | EPH | 1500 | MECL2 | 12/09/09 |
| N | 1612-2 | PCB | 2 | ACETONE | 05/29/10 |
| O | 1647-2 | TPH | 450 | MECL2 | 07/02/10 |
| P | 1621-1 | HCID | 2250 | MECL2 | 05/06/10 |
| Q | 1620-2 | EDB | 1 | MEOH | 06/22/10 |
| R | 1615-1 | RESIN ACID | 250 | ACETONE | 06/17/10 |
| S | 1568-5 | PBDE | .25 | MEOH | 12/11/09 |
| T | 1601-1 | ALKYL PNA | 10 | MEOH | 11/26/09 |
| U | 1633-1 | CONGENER | 2.5 | ACETONE | 08/11/10 |
| V | | | | | |
| *reverified solution | | | | | |
| X | | | | | |
| Y | | | | | |
| Z | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |



**Spike Recovery Control Limits Analysis of PCB / Aroclors in
Aqueous Samples - EPA SW-846 Methods 8081 & 8082^(1,2)**
Effective 5/1/09

Control limits are updated periodically. Assure that you have ARI's current control limits by downloading the files at the time of use. <http://www.arilabs.com/portal/downloads/ARI-CLs.zip>

| Analytical Method: | Standard Analysis | MTCA Analysis | Low Level Analysis | Manchester Extraction |
|---|-------------------|-----------------|--------------------|-------------------------|
| Sample Weight / Final Volume: | 500 / 5 mL | 500 / 1 mL | 1000 / 0.5 mL | 3000 / 1 mL |
| LCS Spike Recovery ⁽⁴⁾ | | | | |
| Aroclor 1016 | 45 - 121 | 36 - 100 | 44 - 117 | 30 - 160 ⁽³⁾ |
| Aroclor 1260 | 54 - 129 | 41 - 113 | 46 - 131 | 30 - 160 ⁽³⁾ |
| | | | | |
| Method Blank/LCS Surrogate Recovery | | | | |
| Tetrachloro- <i>meta</i> -xylene (TCMX) | 40 - 118 | 29 - 100 | 31 - 100 | 30 - 160 ⁽³⁾ |
| Decachlorobiphenyl | 41 - 111 | 35 - 116 | 32 - 108 | 30 - 160 ⁽³⁾ |
| | | | | |
| Sample Surrogate Recovery | | | | |
| Tetrachloro- <i>meta</i> -xylene (TCMX) | 38 - 118 | 25 - 100 | 21 - 100 | 30 - 160 ⁽³⁾ |
| Decachlorobiphenyl | 29 - 118 | 10 - 128 | 19 - 111 | 30 - 160 ⁽³⁾ |

(1) Control Limits calculated using all data generated 1/1/08 through 12/1/08.

(2) Highlighted control limits (**bold font**) adjusted to demonstrate that ARI does not use control limits < 10 for the lower limit or < 100 for the upper limit.

(3) 30 - 160 are default, advisory control limits used when there is insufficient data to calculate historic control limits. **DO NOT** use these limits as the sole reason to reject the data from a batch of analyses.

(4) Laboratory Control Sample (LCS) spike recovery control limits also used as advisory control limits for sample matrix spike (MS) analyzes. MS recovery values are advisory and not used to assess the acceptability of an analytical batch.



Summary of Laboratory Control Limits Metals Analyses (All Methods & Sample Matrices)

Effective 5/1/09

Control limits are updated periodically. Assure that you have ARI's current control limits by downloading the files at the time of use. <http://www.arilabs.com/portal/downloads/ARI-CLs.zip>

| Element | Matrix Spike Recovery | LCS Recovery | Replicate RPD |
|-----------|-----------------------|--------------|---------------|
| Aluminum | 75 - 125 | 80 - 120 | ≤ 20% |
| Antimony | 75 - 125 | 80 - 120 | ≤ 20% |
| Arsenic | 75 - 125 | 80 - 120 | ≤ 20% |
| Barium | 75 - 125 | 80 - 120 | ≤ 20% |
| Beryllium | 75 - 125 | 80 - 120 | ≤ 20% |
| Boron | 75 - 125 | 80 - 120 | ≤ 20% |
| Cadmium | 75 - 125 | 80 - 120 | ≤ 20% |
| Calcium | 75 - 125 | 80 - 120 | ≤ 20% |
| Chromium | 75 - 125 | 80 - 120 | ≤ 20% |
| Cobalt | 75 - 125 | 80 - 120 | ≤ 20% |
| Copper | 75 - 125 | 80 - 120 | ≤ 20% |
| Iron | 75 - 125 | 80 - 120 | ≤ 20% |
| Lead | 75 - 125 | 80 - 120 | ≤ 20% |
| Magnesium | 75 - 125 | 80 - 120 | ≤ 20% |
| Manganese | 75 - 125 | 80 - 120 | ≤ 20% |
| Mercury | 75 - 125 | 80 - 120 | ≤ 20% |
| Nickel | 75 - 125 | 80 - 120 | ≤ 20% |
| Potassium | 75 - 125 | 80 - 120 | ≤ 20% |
| Selenium | 75 - 125 | 80 - 120 | ≤ 20% |
| Silica | 75 - 125 | 80 - 120 | ≤ 20% |
| Silver | 75 - 125 | 80 - 120 | ≤ 20% |
| Sodium | 75 - 125 | 80 - 120 | ≤ 20% |
| Strontium | 75 - 125 | 80 - 120 | ≤ 20% |
| Thallium | 75 - 125 | 80 - 120 | ≤ 20% |
| Vanadium | 75 - 125 | 80 - 120 | ≤ 20% |
| Zinc | 75 - 125 | 80 - 120 | ≤ 20% |

Data Summary Package

prepared
for

The Boeing Company

Project: BP2 SOURCE CONTROL

ARI JOB NO: PX30, PX33

prepared
by

Analytical Resources, Inc.

PCB ANALYSIS

ORGANICS ANALYSIS DATA SHEET

PCB by GC/ECD Method SW8082

Page 1 of 1


Sample ID: PL2SC-W-EB1-111209

SAMPLE

Lab Sample ID: PX33A

LIMS ID: 09-27920

Matrix: Water

Data Release Authorized: 

Reported: 11/23/09

QC Report No: PX33-The Boeing Company

Project: BP2 SOURCE CONTROL

Date Sampled: 11/12/09

Date Received: 11/12/09

Date Extracted: 11/16/09

Date Analyzed: 11/17/09 13:12

Instrument/Analyst: ECD5/AAR

GPC Cleanup: No

Sulfur Cleanup: Yes

Sample Amount: 500 mL

Final Extract Volume: 5.0 mL

Dilution Factor: 1.00

Silica Gel: No

Acid Cleanup: Yes

| CAS Number | Analyte | RL | Result |
|------------|--------------|-----|---------|
| 12674-11-2 | Aroclor 1016 | 1.0 | < 1.0 U |
| 53469-21-9 | Aroclor 1242 | 1.0 | < 1.0 U |
| 12672-29-6 | Aroclor 1248 | 1.0 | < 1.0 U |
| 11097-69-1 | Aroclor 1254 | 1.0 | < 1.0 U |
| 11096-82-5 | Aroclor 1260 | 1.0 | < 1.0 U |
| 11104-28-2 | Aroclor 1221 | 1.0 | < 1.0 U |
| 11141-16-5 | Aroclor 1232 | 1.0 | < 1.0 U |

Reported in $\mu\text{g/L}$ (ppb)

PCB Surrogate Recovery

| | |
|-----------------------|-------|
| Decachlorobiphenyl | 49.8% |
| Tetrachlorometaxylene | 71.2% |

SW8082/PCB WATER SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: PX33-The Boeing Company
Project: BP2 SOURCE CONTROL

| Client ID | DCBP % REC | DCBP LCL-UCL | TCMX % REC | TCMX LCL-UCL | TOT OUT |
|--------------------|---------------|-----------------|---------------|-----------------|---------|
| MB-111609 | 69.2% | 41-111 | 65.0% | 40-118 | 0 |
| LCS-111609 | 62.8% | 41-111 | 68.8% | 40-118 | 0 |
| LCSD-111609 | 64.2% | 41-111 | 65.0% | 40-118 | 0 |
| PL2SC-W-EB1-111209 | 49.8% | 29-118 | 71.2% | 38-118 | 0 |

Prep Method: SW3510C
Log Number Range: 09-27920 to 09-27920

ORGANICS ANALYSIS DATA SHEET

PCB by GC/ECD Method SW8082

Page 1 of 1

Sample ID: LCS-111609

LCS/LCSD

Lab Sample ID: LCS-111609

LIMS ID: 09-27920

Matrix: Water

Data Release Authorized: *AB*

Reported: 11/23/09

QC Report No: PX33-The Boeing Company

Project: BP2 SOURCE CONTROL

Date Sampled: NA

Date Received: NA

Date Extracted LCS/LCSD: 11/16/09

Sample Amount LCS: 500 mL

LCSD: 500 mL

Date Analyzed LCS: 11/17/09 07:05

Final Extract Volume LCS: 5.0 mL

LCSD: 11/17/09 07:27

LCSD: 5.0 mL

Instrument/Analyst LCS: ECD5/AAR

Dilution Factor LCS: 1.00

LCSD: ECD5/AAR

LCSD: 1.00

GPC Cleanup: No

Silica Gel: No

Sulfur Cleanup: Yes

Acid Cleanup: Yes

| Analyte | LCS | Spike Added-LCS | LCS Recovery | LCSD | Spike Added-LCSD | LCSD Recovery | RPD |
|--------------|------|--------------------|-----------------|------|---------------------|------------------|------|
| Aroclor 1016 | 4.87 | 5.00 | 97.4% | 4.51 | 5.00 | 90.2% | 7.7% |
| Aroclor 1260 | 4.60 | 5.00 | 92.0% | 4.24 | 5.00 | 84.8% | 8.1% |

PCB Surrogate Recovery

| | LCS | LCSD |
|-----------------------|-------|-------|
| Decachlorobiphenyl | 62.8% | 64.2% |
| Tetrachlorometaxylene | 68.8% | 65.0% |

Results reported in $\mu\text{g/L}$

RPD calculated using sample concentrations per SW846.

4
PCB METHOD BLANK SUMMARY

BLANK NO.

PX33MBW1

Lab Name: ANALYTICAL RESOURCES, INC

Client: THE BOEING COMPANY

ARI Job No.: PX33

Project: BP2 SOURCE CONTROL

Lab Sample ID: PX33MBW1

Lab File ID: 1116B056

Date Extracted: 11/16/09

Matrix: LIQUID

Date Analyzed: 11/17/09

Instrument ID: ECD5

Time Analyzed: 0643

GC Columns: ZB5/ZB35

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

| | CLIENT SAMPLE NO. ===== | LAB SAMPLE ID ===== | DATE ANALYZED ===== |
|----|-------------------------------|---------------------------|---------------------------|
| 01 | PX33LCSW1 | PX33LCSW1 | 11/17/09 |
| 02 | PX33LCSDW1 | PX33LCSDW1 | 11/17/09 |
| 03 | PL2SC-W-EB1-111209 | PX33A | 11/17/09 |

ALL RUNS ARE DUAL COLUMN

ORGANICS ANALYSIS DATA SHEET

PCB by GC/ECD Method SW8082

Page 1 of 1

Sample ID: MB-111609

METHOD BLANK

Lab Sample ID: MB-111609

LIMS ID: 09-27920

Matrix: Water

Data Release Authorized: 

Reported: 11/23/09

QC Report No: PX33-The Boeing Company

Project: BP2 SOURCE CONTROL

Date Sampled: NA

Date Received: NA

Date Extracted: 11/16/09

Date Analyzed: 11/17/09 06:43

Instrument/Analyst: ECD5/AAR

GPC Cleanup: No

Sulfur Cleanup: Yes

Sample Amount: 500 mL

Final Extract Volume: 5.0 mL

Dilution Factor: 1.00

Silica Gel: No

Acid Cleanup: Yes

| CAS Number | Analyte | RL | Result |
|------------|--------------|-----|---------|
| 12674-11-2 | Aroclor 1016 | 1.0 | < 1.0 U |
| 53469-21-9 | Aroclor 1242 | 1.0 | < 1.0 U |
| 12672-29-6 | Aroclor 1248 | 1.0 | < 1.0 U |
| 11097-69-1 | Aroclor 1254 | 1.0 | < 1.0 U |
| 11096-82-5 | Aroclor 1260 | 1.0 | < 1.0 U |
| 11104-28-2 | Aroclor 1221 | 1.0 | < 1.0 U |
| 11141-16-5 | Aroclor 1232 | 1.0 | < 1.0 U |

Reported in $\mu\text{g/L}$ (ppb)

PCB Surrogate Recovery

| | |
|-----------------------|-------|
| Decachlorobiphenyl | 69.2% |
| Tetrachlorometaxylene | 65.0% |

METALS ANALYSIS

INORGANICS ANALYSIS DATA SHEET

DISSOLVED METALS

Page 1 of 1

Sample ID: PL2SC-W-EB1-111209

SAMPLE

Lab Sample ID: PX33A

LIMS ID: 09-27920

Matrix: Water

Data Release Authorized

Reported: 11/19/09

QC Report No: PX33-The Boeing Company

Project: BP2 SOURCE CONTROL

Date Sampled: 11/12/09

Date Received: 11/12/09


| Prep Meth | Prep Date | Analysis Method | Analysis Date | CAS Number | Analyte | RL | µg/L | Q |
|--------------|--------------|--------------------|------------------|------------------|-------------|-----|-----------|---|
| 200.8 | 11/12/09 | 200.8 | 11/18/09 | 7440-38-2 | Arsenic | 0.2 | 0.2 | U |
| 6010B | 11/12/09 | 6010B | 11/17/09 | 7440-43-9 | Cadmium | 2 | 2 | U |
| 6010B | 11/12/09 | 6010B | 11/17/09 | 7440-47-3 | Chromium | 5 | 5 | U |
| 6010B | 11/12/09 | 6010B | 11/17/09 | 7440-50-8 | Copper | 2 | 2 | U |
| 200.8 | 11/12/09 | 200.8 | 11/18/09 | 7439-92-1 | Lead | 1 | 1 | U |
| 6010B | 11/12/09 | 6010B | 11/17/09 | 7440-22-4 | Silver | 3 | 3 | U |
| 6010B | 11/12/09 | 6010B | 11/17/09 | 7440-66-6 | Zinc | 10 | 10 | |

U-Analyte undetected at given RL

RL-Reporting Limit

INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS
Page 1 of 1

Sample ID: PL2SC-W-EB1-111209
MATRIX SPIKE

Lab Sample ID: PX33A
LIMS ID: 09-27920
Matrix: Water
Data Release Authorized: 
Reported: 11/19/09

QC Report No: PX33-The Boeing Company
Project: BP2 SOURCE CONTROL

Date Sampled: 11/12/09
Date Received: 11/12/09

MATRIX SPIKE QUALITY CONTROL REPORT

| Analyte | Analysis Method | Sample | Spike | Spike Added | % Recovery | Q |
|----------|-----------------|---------|-------|-------------|------------|---|
| Arsenic | 200.8 | 0.200 U | 25.8 | 25.0 | 103% | |
| Cadmium | 6010B | 2.00 U | 564 | 500 | 113% | |
| Chromium | 6010B | 5.00 U | 537 | 500 | 107% | |
| Copper | 6010B | 2.00 U | 511 | 500 | 102% | |
| Lead | 200.8 | 1.00 U | 23.2 | 25.0 | 92.8% | |
| Silver | 6010B | 3.00 U | 467 | 500 | 93.4% | |
| Zinc | 6010B | 14.3 | 528 | 500 | 103% | |

Reported in µg/L

N-Control Limit Not Met

H-% Recovery Not Applicable, Sample Concentration Too High

NA-Not Applicable, Analyte Not Spiked

Percent Recovery Limits: 75-125%

INORGANICS ANALYSIS DATA SHEET

DISSOLVED METALS

Page 1 of 1


Sample ID: PL2SC-W-EB1-111209

DUPLICATE

Lab Sample ID: PX33A

LIMS ID: 09-27920

Matrix: Water

Data Release Authorized: 

Reported: 11/19/09

QC Report No: PX33-The Boeing Company

Project: BP2 SOURCE CONTROL

Date Sampled: 11/12/09

Date Received: 11/12/09

MATRIX DUPLICATE QUALITY CONTROL REPORT

| Analyte | Analysis Method | Sample | Duplicate | RPD | Control Limit | Q |
|----------|-----------------|--------|-----------|------|---------------|---|
| Arsenic | 200.8 | 0.2 U | 0.2 U | 0.0% | +/- 0.2 | L |
| Cadmium | 6010B | 2 U | 2 U | 0.0% | +/- 2 | L |
| Chromium | 6010B | 5 U | 5 U | 0.0% | +/- 5 | L |
| Copper | 6010B | 2 U | 2 U | 0.0% | +/- 2 | L |
| Lead | 200.8 | 1 U | 1 U | 0.0% | +/- 1 | L |
| Silver | 6010B | 3 U | 3 U | 0.0% | +/- 3 | L |
| Zinc | 6010B | 10 | 10 | 0.0% | +/- 10 | L |


Reported in µg/L

*-Control Limit Not Met

L-RPD Invalid, Limit = Detection Limit

INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS
Page 1 of 1

Sample ID: LAB CONTROL

Lab Sample ID: PX33LCS
LIMS ID: 09-27920
Matrix: Water
Data Release Authorized: 
Reported: 11/19/09

QC Report No: PX33-The Boeing Company
Project: BP2 SOURCE CONTROL
Date Sampled: NA
Date Received: NA

BLANK SPIKE QUALITY CONTROL REPORT

| Analyte | Analysis Method | Spike Found | Spike Added | % Recovery | Q |
|----------|-----------------|-------------|-------------|------------|---|
| Arsenic | 200.8 | 25.1 | 25.0 | 100% | |
| Cadmium | 6010B | 562 | 500 | 112% | |
| Chromium | 6010B | 545 | 500 | 109% | |
| Copper | 6010B | 510 | 500 | 102% | |
| Lead | 200.8 | 23 | 25 | 92.0% | |
| Silver | 6010B | 467 | 500 | 93.4% | |
| Zinc | 6010B | 520 | 500 | 104% | |

Reported in µg/L

N-Control limit not met
Control Limits: 80-120%

INORGANICS ANALYSIS DATA SHEET

DISSOLVED METALS


Page 1 of 1

Sample ID: METHOD BLANK

Lab Sample ID: PX33MB

LIMS ID: 09-27920

Matrix: Water

Data Release Authorized: 

Reported: 11/19/09

QC Report No: PX33-The Boeing Company

Project: BP2 SOURCE CONTROL

Date Sampled: NA

Date Received: NA

| Prep Meth | Prep Date | Analysis Method | Analysis Date | CAS Number | Analyte | RL | µg/L | Q |
|--------------|--------------|--------------------|------------------|------------|----------|-----|------|---|
| 200.8 | 11/12/09 | 200.8 | 11/18/09 | 7440-38-2 | Arsenic | 0.2 | 0.2 | U |
| 6010B | 11/12/09 | 6010B | 11/17/09 | 7440-43-9 | Cadmium | 2 | 2 | U |
| 6010B | 11/12/09 | 6010B | 11/17/09 | 7440-47-3 | Chromium | 5 | 5 | U |
| 6010B | 11/12/09 | 6010B | 11/17/09 | 7440-50-8 | Copper | 2 | 2 | U |
| 200.8 | 11/12/09 | 200.8 | 11/18/09 | 7439-92-1 | Lead | 1 | 1 | U |
| 6010B | 11/12/09 | 6010B | 11/17/09 | 7440-22-4 | Silver | 3 | 3 | U |
| 6010B | 11/12/09 | 6010B | 11/17/09 | 7440-66-6 | Zinc | 10 | 10 | U |

U-Analyte undetected at given RL

RL-Reporting Limit

MERCURY ANALYSIS

INORGANICS ANALYSIS DATA SHEET
Dissolved Mercury by Method SW7470A



Data Release Authorized
Reported: 11/20/09
Date Received: 11/12/09
Page 1 of 1

QC Report No: PX30-The Boeing Company
Project: BP2 Source Control

| Client/ ARI ID | Date Sampled | Matrix | Prep Date Anal Date | RL | Result |
|--------------------------------------|-----------------|--------|------------------------|------|--------|
| PL2SC-W-EB1-111209 PX30A 09-27891 | 11/12/09 | Water | 11/13/09 11/19/09 | 20.0 | 20.0 U |
| MB-111309 Method Blank | NA | Water | 11/13/09 11/19/09 | 20.0 | 20.0 U |

Reported in ng/L

RL-Analytical reporting limit
U-Undetected at reported detection limit

INORGANICS ANALYSIS DATA SHEET

DISSOLVED METALS

Page 1 of 1

Sample ID: PL2SC-W-EB1-111209

MATRIX SPIKE

Lab Sample ID: PX30A

LIMS ID: 09-27891

Matrix: Water

Data Release Authorized

Reported: 11/20/09

QC Report No: PX30-The Boeing Company

Project: BP2 Source Control

Date Sampled: 11/12/09

Date Received: 11/12/09

MATRIX SPIKE QUALITY CONTROL REPORT

| Analyte | Analysis Method | Sample | Spike | Spike Added | % Recovery | Q |
|---------|-----------------|--------|-------|-------------|------------|---|
| Mercury | 7470A | 20.0 U | 103 | 100 | 103% | |

Reported in ng/L

N-Control Limit Not Met

H-% Recovery Not Applicable, Sample Concentration Too High

NA-Not Applicable, Analyte Not Spiked

Percent Recovery Limits: 75-125%

INORGANICS ANALYSIS DATA SHEET

DISSOLVED METALS

Page 1 of 1


Sample ID: PL2SC-W-EB1-111209

DUPLICATE

Lab Sample ID: PX30A

LIMS ID: 09-27891

Matrix: Water

Data Release Authorized: 

Reported: 11/20/09

QC Report No: PX30-The Boeing Company

Project: BP2 Source Control

Date Sampled: 11/12/09

Date Received: 11/12/09

MATRIX DUPLICATE QUALITY CONTROL REPORT

| Analyte | Analysis Method | Sample | Duplicate | RPD | Control Limit | Q |
|---------|-----------------|--------|-----------|------|---------------|---|
| Mercury | 7470A | 20.0 U | 20.0 U | 0.0% | +/- 20.0 | L |

Reported in ng/L

*-Control Limit Not Met

L-RPD Invalid, Limit = Detection Limit

INORGANICS ANALYSIS DATA SHEET

DISSOLVED METALS


Page 1 of 1

Sample ID: LAB CONTROL

Lab Sample ID: PX30LCS

LIMS ID: 09-27891

Matrix: Water

Data Release Authorized: 

Reported: 11/20/09

QC Report No: PX30-The Boeing Company

Project: BP2 Source Control

Date Sampled: NA

Date Received: NA

BLANK SPIKE QUALITY CONTROL REPORT

| Analyte | Analysis Method | Spike Found | Spike Added | % Recovery | Q |
|---------|-----------------|-------------|-------------|------------|---|
| Mercury | 7470A | 181 | 200 | 90.5% | |

Reported in ng/L

N-Control limit not met

Control Limits: 80-120%



Analytical Resources, Incorporated
Analytical Chemists and Consultants

November 24, 2009

Kent Angelos
Golder Associates, Inc.
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

RE: Boeing Plant 2 Source Control
ARI IDs: PX46 & PX47

Dear Kent:

Please find enclosed the original Chain of Custody (COC) records, sample receipt documentation, and the final data package for the project referenced above.

Sample receipt information and analytical details are addressed in the Case Narrative.

An electronic copy of this package will be kept on file at ARI. If you have any questions or require additional information, please contact me at your convenience.

Sincerely,
ANALYTICAL RESOURCES, INC.

Kelly Bottem
Client Services Manager
(206) 695-6211
kellyb@arilabs.com

KB/ej

cc: Kent Angelos, Golder Associates Inc., 18300 NE Union Hill Road, Suite 200,
Redmond, WA 98052-3333

Enclosures

Chain of Custody
Documentation

prepared
for

The Boeing Company

Project: Boeing Plant 2 Source Control

ARI JOB NO: PX46, PX47

prepared
by

Analytical Resources, Inc.

Analytical Resources, Incorporated
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)

| | | | |
|--------------------------------|-------------------------------|----------------------|----------------------|
| ARI Assigned Number: PX440 | Turn-around Requested: Std | Page: 1 of 1 | |
| ARI Client Company: BOEING | Phone: | Date: 11/13/2009 | Ice Present? Y |
| Client Contact: WILL ERNEST | | No. of Coolers: 1 | Cooler Temps: 5.0 |

[illegible]

Limits of Liability: ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.

PRESERVATION VERIFICATION 11/13/09

Page 1 of 1

Inquiry Number: NONE
 Analysis Requested: 11/13/09
 Contact: Ernst, Will
 Client: The Boeing Company
 Logged by: AV
 Sample Set Used: Yes-481
 Validatable Package: No
 Deliverables:



ARI Job No: PX46

PC: Kelly
 VTSR: 11/13/09

Project #:
 Project: Boeing Plant 2 Source Control
 Sample Site:
 SDG No:
 Analytical Protocol: In-house

| LOGNUM | ARI ID | CLIENT ID | CN | WAD | NH3 | COD | FOG | MET | PHEN | PHOS | TKN | NO23 | TOC | S2 | AKI02 | Fe2+ | DMET | DOC | FLT | FLT | PARAMETER | ADJUSTED | LOT | AMOUNT | DATE/BY |
|----------|--------|---------------------|----|-----|-----|-----|-----|-----|------|------|-----|------|-----|----|-------|------|------|-----|-----|-----|-----------|----------|-----|--------|---------|
| 09-28006 | PX46A | PL2SC-W-J249-111309 | | | | | | DIS | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | |

Checked By AV Date 11/13/09



Analytical Resources,
Incorporated
Analytical Chemists and
Consultants

Cooler Receipt Form

ARI Client: Boeing

COC No(s): _____ (NA)

Assigned ARI Job No: PX46

Project Name: BP2 Source Control

Delivered by: Fed-Ex UPS Courier Hand Delivered Other: _____

Tracking No: _____ (NA)

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to cooler? _____

YES NO

Were custody papers included with the cooler? _____

YES NO

Were custody papers properly filled out (ink, signed, etc.) _____

YES NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry)..... 5.6

If cooler temperature is out of compliance fill out form 00070F

Temp Gun ID#: 90941619

Cooler Accepted by: AV Date: 11/13/09 Time: 910

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler? _____

YES NO

What kind of packing material was used? ... Bubble Wrap Wet Ice Gel Packs Baggies Foam Block Paper Other: _____

Was sufficient ice used (if appropriate)? _____

NA YES NO

Were all bottles sealed in individual plastic bags? _____

YES NO

Did all bottles arrive in good condition (unbroken)? _____

YES NO

Were all bottle labels complete and legible? _____

YES NO

Did the number of containers listed on COC match with the number of containers received? _____

YES NO

Did all bottle labels and tags agree with custody papers? _____

YES NO

Were all bottles used correct for the requested analyses? _____

YES NO

Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)...

NA YES NO

Were all VOC vials free of air bubbles? _____

NA YES NO

Was sufficient amount of sample sent in each bottle? _____

YES NO

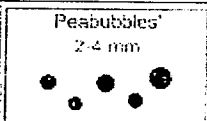
Samples Logged by: AV Date: 11/13/09 Time: 925

**** Notify Project Manager of discrepancies or concerns ****

| Sample ID on Bottle | Sample ID on COC | Sample ID on Bottle | Sample ID on COC |
|---------------------|------------------|---------------------|------------------|
| | | | |
| | | | |
| | | | |
| | | | |

Additional Notes, Discrepancies, & Resolutions:

By: _____ Date: _____



Small → "sm"

Peabubbles → "pb"

Large → "lg"

Headspace → "hs"

Analytical Resources, Incorporated
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)

[illegible]

Limits of Liability: ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.

PRESERVATION VERIFICATION 11/13/09

Page 1 of 1

Inquiry Number: NONE
 Analysis Requested: 11/13/09
 Contact: Ernst, Will
 Client: The Boeing Company
 Logged by: AV
 Sample Set Used: Yes-481
 Validatable Package: No
 Deliverables:



ARI Job No: PX47

PC: Kelly
 VTSR: 11/13/09

Project #:
 Project: Boeing Plant 2 Source Control
 Sample Site:
 SDG No:
 Analytical Protocol: In-house

| LOGNUM | CLIENT ID | CN | WAD | NH3 | COD | FOG | MET | PHEN | PHOS | TKN | NO23 | TOC | S2 | AK102 | Fe2+ | DMET DOC | FLT | FLT | PARAMETER | ADJUSTED TO | LOT NUMBER | AMOUNT ADDED | DATE/BY |
|----------|---------------------|-----|-----|-----|-----|-----|-----|------|------|-----|------|-----|----|-------|------|----------|-----|-----|-----------|-------------|------------|--------------|---------|
| 09-28007 | | >12 | >12 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | >9 | <2 | <2 | Y | | | | | | | |
| PX47A | PL2SC-W-J249-111309 | | | | | | DIS | | | | | | | | | | | | | | | | |

Checked By AV Date 11/13/09



Analytical Resources,
Incorporated
Analytical Chemists and
Consultants

Cooler Receipt Form

ARI Client: Boeing

COC No(s): _____ (NA)

Assigned ARI Job No: PX47

Project Name: BP2 Source Control

Delivered by: Fed-Ex UPS Courier Hand Delivered Other: _____

Tracking No: _____ (NA)

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to cooler? YES NO

Were custody papers included with the cooler? YES NO

Were custody papers properly filled out (ink, signed, etc.) YES NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry)..... 5.6

If cooler temperature is out of compliance fill out form 00070F

Temp Gun ID#: 90941619

Cooler Accepted by: AV Date: 11/13/09 Time: 910

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler? YES NO

What kind of packing material was used? ... Bubble Wrap Wet Ice Gel Packs Baggies Foam Block Paper Other: _____

Was sufficient ice used (if appropriate)? NA YES NO

Were all bottles sealed in individual plastic bags? YES NO

Did all bottles arrive in good condition (unbroken)? YES NO

Were all bottle labels complete and legible? YES NO

Did the number of containers listed on COC match with the number of containers received? YES NO

Did all bottle labels and tags agree with custody papers? YES NO

Were all bottles used correct for the requested analyses? YES NO

Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)... NA YES NO

Were all VOC vials free of air bubbles? (NA) YES NO

Was sufficient amount of sample sent in each bottle? YES NO

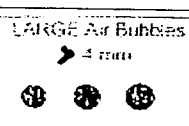
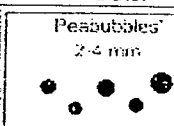
Samples Logged by: AV Date: 11/13/09 Time: 937

**** Notify Project Manager of discrepancies or concerns ****

| Sample ID on Bottle | Sample ID on COC | Sample ID on Bottle | Sample ID on COC |
|---------------------|------------------|---------------------|------------------|
| | | | |
| | | | |
| | | | |
| | | | |

Additional Notes, Discrepancies, & Resolutions:

By: _____ Date: _____



Small → "sm"
Peabubbles → "pb"
Large → "lg"
Headspace → "hs"

Case Narrative

prepared
for

The Boeing Company

Project: Boeing Plant 2 Source Control

ARI JOB NO: PX46, PX47

prepared
by

Analytical Resources, Inc.



Case Narrative

Project: Boeing Plant 2 Source Control

ARI IDs: PX46 & PX47

Matrix: Water

Date: November 24, 2009

Sample Receipt Information

One water sample was received in good condition at Analytical Resources, Inc. (ARI) on November 13, 2009 under ARI sample delivery groups (SDGs) PX46 and PX47. The cooler temperature, as measured by IR thermometer, was 5.6°C. For further details regarding sample receipt, please refer to the enclosed Cooler Receipt Form and Preservation Verification sheet.

The sample was analyzed for the parameters listed below, as requested on the Chain of Custody.

Dissolved Metals by Methods 6010B and 7000 series

The samples were digested on 11/13/09. The digests were analyzed between 11/17/09 and 11/20/09 within the method recommended holding times.

Replicate/Matrix Spike(s): All percent recoveries were within compliance.

Samples: No anomalies were encountered for these samples.

LCS/Blank Spike(s): All percent recoveries were within compliance.

Method Blank(s): Were in control.

Dissolved Low-Level Mercury by Method SW7470A

The samples were digested on 11/13/09. The digests were analyzed on 11/19/09 within the method recommended holding times.

Replicate/Matrix Spike(s): All percent recoveries were within compliance.

Samples: No anomalies were encountered for these samples.

LCS/Blank Spike(s): All percent recoveries were within compliance.

Method Blank(s): Were in control.



Data Reporting Qualifiers

Effective 7/10/2009

Inorganic Data

- U Indicates that the target analyte was not detected at the reported concentration
- * Duplicate RPD is not within established control limits
- B Reported value is less than the CRDL but \geq the Reporting Limit
- N Matrix Spike recovery not within established control limits
- NA Not Applicable, analyte not spiked
- H The natural concentration of the spiked element is so much greater than the concentration spiked that an accurate determination of spike recovery is not possible
- L Analyte concentration is ≤ 5 times the Reporting Limit and the replicate control limit defaults to ± 1 RL instead of the normal 20% RPD

Organic Data

- U Indicates that the target analyte was not detected at the reported concentration
- * Flagged value is not within established control limits
- B Analyte detected in an associated Method Blank at a concentration greater than one-half of ARI's Reporting Limit or 5% of the regulatory limit or 5% of the analyte concentration in the sample.
- J Estimated concentration when the value is less than ARI's established reporting limits
- D The spiked compound was not detected due to sample extract dilution
- E Estimated concentration calculated for an analyte response above the valid instrument calibration range. A dilution is required to obtain an accurate quantification of the analyte.
- Q Indicates a detected analyte with an initial or continuing calibration that does not meet established acceptance criteria ($< 20\%$ RSD, $< 20\%$ Drift or minimum RRF).
- S Indicates an analyte response that has saturated the detector. The calculated concentration is not valid; a dilution is required to obtain valid quantification of the analyte



- NA The flagged analyte was not analyzed for
- NR Spiked compound recovery is not reported due to chromatographic interference
- NS The flagged analyte was not spiked into the sample
- M Estimated value for an analyte detected and confirmed by an analyst but with low spectral match parameters. This flag is used only for GC-MS analyses
- M2 The sample contains PCB congeners that do not match any standard Aroclor pattern. The PCBs are identified and quantified as the Aroclor whose pattern most closely matches that of the sample. The reported value is an estimate.
- N The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification"
- Y The analyte is not detected at or above the reported concentration. The reporting limit is raised due to chromatographic interference. The Y flag is equivalent to the U flag with a raised reporting limit.
- C The analyte was positively identified on only one of two chromatographic columns. Chromatographic interference prevented a positive identification on the second column
- P The analyte was detected on both chromatographic columns but the quantified values differ by $\geq 40\%$ RPD with no obvious chromatographic interference

Geotechnical Data

- A The total of all fines fractions. This flag is used to report total fines when only sieve analysis is requested and balances total grain size with sample weight.
- F Samples were frozen prior to particle size determination
- SM Sample matrix was not appropriate for the requested analysis. This normally refers to samples contaminated with an organic product that interferes with the sieving process and/or moisture content, porosity and saturation calculations
- SS Sample did not contain the proportion of "fines" required to perform the pipette portion of the grain size analysis
- W Weight of sample in some pipette aliquots was below the level required for accurate weighting



Summary of Laboratory Control Limits Metals Analyses (All Methods & Sample Matrices)

Effective 5/1/09

Control limits are updated periodically. Assure that you have ARI's current control limits by downloading the files at the time of use. <http://www.arilabs.com/portal/downloads/ARI-CLs.zip>

| Element | Matrix Spike Recovery | LCS Recovery | Replicate RPD |
|-----------|-----------------------|--------------|---------------|
| Aluminum | 75 - 125 | 80 - 120 | ≤ 20% |
| Antimony | 75 - 125 | 80 - 120 | ≤ 20% |
| Arsenic | 75 - 125 | 80 - 120 | ≤ 20% |
| Barium | 75 - 125 | 80 - 120 | ≤ 20% |
| Beryllium | 75 - 125 | 80 - 120 | ≤ 20% |
| Boron | 75 - 125 | 80 - 120 | ≤ 20% |
| Cadmium | 75 - 125 | 80 - 120 | ≤ 20% |
| Calcium | 75 - 125 | 80 - 120 | ≤ 20% |
| Chromium | 75 - 125 | 80 - 120 | ≤ 20% |
| Cobalt | 75 - 125 | 80 - 120 | ≤ 20% |
| Copper | 75 - 125 | 80 - 120 | ≤ 20% |
| Iron | 75 - 125 | 80 - 120 | ≤ 20% |
| Lead | 75 - 125 | 80 - 120 | ≤ 20% |
| Magnesium | 75 - 125 | 80 - 120 | ≤ 20% |
| Manganese | 75 - 125 | 80 - 120 | ≤ 20% |
| Mercury | 75 - 125 | 80 - 120 | ≤ 20% |
| Nickel | 75 - 125 | 80 - 120 | ≤ 20% |
| Potassium | 75 - 125 | 80 - 120 | ≤ 20% |
| Selenium | 75 - 125 | 80 - 120 | ≤ 20% |
| Silica | 75 - 125 | 80 - 120 | ≤ 20% |
| Silver | 75 - 125 | 80 - 120 | ≤ 20% |
| Sodium | 75 - 125 | 80 - 120 | ≤ 20% |
| Strontium | 75 - 125 | 80 - 120 | ≤ 20% |
| Thallium | 75 - 125 | 80 - 120 | ≤ 20% |
| Vanadium | 75 - 125 | 80 - 120 | ≤ 20% |
| Zinc | 75 - 125 | 80 - 120 | ≤ 20% |

Data Summary Package

prepared
for

The Boeing Company

Project: Boeing Plant 2 Source Control

ARI JOB NO: PX46, PX47


prepared
by

Analytical Resources, Inc.

METALS ANALYSIS

INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS
Page 1 of 1

Sample ID: PL2SC-W-J249-111309
SAMPLE

Lab Sample ID: PX46A
LIMS ID: 09-28006
Matrix: Water
Data Release Authorized: 
Reported: 11/24/09

QC Report No: PX46-The Boeing Company
Project: Boeing Plant 2 Source Control

Date Sampled: 11/13/09
Date Received: 11/13/09

| Prep Meth | Prep Date | Analysis Method | Analysis Date | CAS Number | Analyte | RL | µg/L | Q |
|-----------|-----------|-----------------|---------------|------------|----------|-----|------|---|
| 200.8 | 11/13/09 | 200.8 | 11/20/09 | 7440-38-2 | Arsenic | 0.2 | 0.2 | |
| 6010B | 11/13/09 | 6010B | 11/17/09 | 7440-43-9 | Cadmium | 2 | 2 | U |
| 6010B | 11/13/09 | 6010B | 11/17/09 | 7440-47-3 | Chromium | 5 | 5 | U |
| 6010B | 11/13/09 | 6010B | 11/17/09 | 7440-50-8 | Copper | 2 | 5 | |
| 200.8 | 11/13/09 | 200.8 | 11/20/09 | 7439-92-1 | Lead | 1 | 1 | U |
| 6010B | 11/13/09 | 6010B | 11/17/09 | 7440-22-4 | Silver | 3 | 3 | U |
| 6010B | 11/13/09 | 6010B | 11/17/09 | 7440-66-6 | Zinc | 10 | 80 | |

U-Analyte undetected at given RL
RL-Reporting Limit

INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS


Page 1 of 1

Sample ID: PL2SC-W-J249-111309
DUPLICATE

Lab Sample ID: PX46A

LIMS ID: 09-28006

Matrix: Water

Data Release Authorized: 

Reported: 11/24/09

QC Report No: PX46-The Boeing Company

Project: Boeing Plant 2 Source Control

Date Sampled: 11/13/09

Date Received: 11/13/09

MATRIX DUPLICATE QUALITY CONTROL REPORT

| Analyte | Analysis Method | Sample | Duplicate | RPD | Control Limit | Q |
|----------|-----------------|--------|-----------|-------|---------------|---|
| Arsenic | 200.8 | 0.2 | 0.2 | 0.0% | +/- 0.2 | L |
| Cadmium | 6010B | 2 U | 2 U | 0.0% | +/- 2 | L |
| Chromium | 6010B | 5 U | 5 U | 0.0% | +/- 5 | L |
| Copper | 6010B | 5 | 5 | 0.0% | +/- 2 | L |
| Lead | 200.8 | 1 U | 1 U | 0.0% | +/- 1 | L |
| Silver | 6010B | 3 U | 3 U | 0.0% | +/- 3 | L |
| Zinc | 6010B | 80 | 90 | 11.8% | +/- 20% | |

Reported in µg/L

*-Control Limit Not Met

L-RPD Invalid, Limit = Detection Limit

INORGANICS ANALYSIS DATA SHEET

DISSOLVED METALS

Page 1 of 1


Sample ID: PL2SC-W-J249-111309

MATRIX SPIKE

Lab Sample ID: PX46A

LIMS ID: 09-28006

Matrix: Water

Data Release Authorized: 

Reported: 11/24/09

QC Report No: PX46-The Boeing Company

Project: Boeing Plant 2 Source Control

Date Sampled: 11/13/09

Date Received: 11/13/09

MATRIX SPIKE QUALITY CONTROL REPORT

| Analyte | Analysis Method | Sample | Spike | Spike Added | % Recovery | Q |
|----------|-----------------|--------|-------|-------------|------------|---|
| Arsenic | 200.8 | 0.200 | 26.0 | 25.0 | 103% | |
| Cadmium | 6010B | 2.00 U | 571 | 500 | 114% | |
| Chromium | 6010B | 5.00 U | 531 | 500 | 106% | |
| Copper | 6010B | 4.84 | 525 | 500 | 104% | |
| Lead | 200.8 | 1.00 U | 26.0 | 25.0 | 104% | |
| Silver | 6010B | 3.00 U | 459 | 500 | 91.8% | |
| Zinc | 6010B | 84.1 | 597 | 500 | 103% | |

Reported in µg/L

N-Control Limit Not Met

H-% Recovery Not Applicable, Sample Concentration Too High

NA-Not Applicable, Analyte Not Spiked

Percent Recovery Limits: 75-125%

INORGANICS ANALYSIS DATA SHEET

DISSOLVED METALS


Page 1 of 1

Sample ID: LAB CONTROL

Lab Sample ID: PX46LCS

LIMS ID: 09-28006

Matrix: Water

Data Release Authorized: 

Reported: 11/24/09

QC Report No: PX46-The Boeing Company

Project: Boeing Plant 2 Source Control

Date Sampled: NA

Date Received: NA

BLANK SPIKE QUALITY CONTROL REPORT

| Analyte | Analysis Method | Spike Found | Spike Added | % Recovery | Q |
|----------|-----------------|-------------|-------------|------------|---|
| Arsenic | 200.8 | 25.4 | 25.0 | 102% | |
| Cadmium | 6010B | 572 | 500 | 114% | |
| Chromium | 6010B | 552 | 500 | 110% | |
| Copper | 6010B | 518 | 500 | 104% | |
| Lead | 200.8 | 25 | 25 | 100% | |
| Silver | 6010B | 472 | 500 | 94.4% | |
| Zinc | 6010B | 530 | 500 | 106% | |

Reported in µg/L

N-Control limit not met

Control Limits: 80-120%

INORGANICS ANALYSIS DATA SHEET

DISSOLVED METALS

Page 1 of 1

Sample ID: METHOD BLANK

Lab Sample ID: PX46MB

LIMS ID: 09-28006

Matrix: Water

Data Release Authorized: 

Reported: 11/24/09

QC Report No: PX46-The Boeing Company

Project: Boeing Plant 2 Source Control

Date Sampled: NA

Date Received: NA

| Prep Meth | Prep Date | Analysis Method | Analysis Date | CAS Number | Analyte | RL | µg/L | Q |
|--------------|--------------|--------------------|------------------|------------|----------|-----|------|---|
| 200.8 | 11/13/09 | 200.8 | 11/20/09 | 7440-38-2 | Arsenic | 0.2 | 0.2 | U |
| 6010B | 11/13/09 | 6010B | 11/17/09 | 7440-43-9 | Cadmium | 2 | 2 | U |
| 6010B | 11/13/09 | 6010B | 11/17/09 | 7440-47-3 | Chromium | 5 | 5 | U |
| 6010B | 11/13/09 | 6010B | 11/17/09 | 7440-50-8 | Copper | 2 | 2 | U |
| 200.8 | 11/13/09 | 200.8 | 11/20/09 | 7439-92-1 | Lead | 1 | 1 | U |
| 6010B | 11/13/09 | 6010B | 11/17/09 | 7440-22-4 | Silver | 3 | 3 | U |
| 6010B | 11/13/09 | 6010B | 11/17/09 | 7440-66-6 | Zinc | 10 | 10 | U |

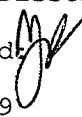
U-Analyte undetected at given RL

RL-Reporting Limit

MERCURY ANALYSIS

INORGANICS ANALYSIS DATA SHEET
Dissolved Mercury by Method SW7470A

ANALYTICAL
RESOURCES
INCORPORATED 

Data Release Authorized: 
Reported: 11/20/09
Date Received: 11/13/09
Page 1 of 1

QC Report No: PX47-The Boeing Company
Project: Boeing Plant 2 Source Control

| Client/ ARI ID | Date Sampled | Matrix | Prep Date Anal Date | RL | Result |
|---------------------------------------|-----------------|--------|------------------------|------|--------|
| PL2SC-W-J249-111309 PX47A 09-28007 | 11/13/09 | Water | 11/13/09 11/19/09 | 20.0 | 20.0 U |
| MB-111309 Method Blank | NA | Water | 11/13/09 11/19/09 | 20.0 | 20.0 U |

Reported in ng/L

RL-Analytical reporting limit
U-Undetected at reported detection limit

INORGANICS ANALYSIS DATA SHEET

DISSOLVED METALS

Page 1 of 1


Sample ID: PL2SC-W-J249-111309

MATRIX SPIKE

Lab Sample ID: PX47A

LIMS ID: 09-28007

Matrix: Water

Data Release Authorized 

Reported: 11/20/09

QC Report No: PX47-The Boeing Company

Project: Boeing Plant 2 Source Control

Date Sampled: 11/13/09

Date Received: 11/13/09

MATRIX SPIKE QUALITY CONTROL REPORT

| Analyte | Analysis Method | Sample | Spike | Spike Added | % Recovery | Q |
|---------|--------------------|--------|-------|----------------|---------------|---|
| Mercury | 7470A | 20.0 U | 113 | 100 | 113% | |

Reported in ng/L

N-Control Limit Not Met

H-% Recovery Not Applicable, Sample Concentration Too High

NA-Not Applicable, Analyte Not Spiked

Percent Recovery Limits: 75-125%

INORGANICS ANALYSIS DATA SHEET

DISSOLVED METALS

Page 1 of 1

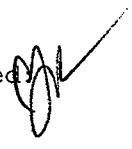
Sample ID: PL2SC-W-J249-111309

DUPLICATE

Lab Sample ID: PX47A

LIMS ID: 09-28007

Matrix: Water

Data Release Authorized 

Reported: 11/20/09

QC Report No: PX47-The Boeing Company

Project: Boeing Plant 2 Source Control

Date Sampled: 11/13/09

Date Received: 11/13/09

MATRIX DUPLICATE QUALITY CONTROL REPORT

| Analyte | Analysis Method | Sample | Duplicate | RPD | Control Limit | Q |
|---------|-----------------|--------|-----------|------|---------------|---|
| Mercury | 7470A | 20.0 U | 20.0 U | 0.0% | +/- 20.0 | L |


Reported in ng/L

*-Control Limit Not Met

L-RPD Invalid, Limit = Detection Limit

INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS
Page 1 of 1

Sample ID: LAB CONTROL

Lab Sample ID: PX47LCS
LIMS ID: 09-28007
Matrix: Water
Data Release Authorized 
Reported: 11/20/09

QC Report No: PX47-The Boeing Company
Project: Boeing Plant 2 Source Control
Date Sampled: NA
Date Received: NA

BLANK SPIKE QUALITY CONTROL REPORT

| Analyte | Analysis Method | Spike Found | Spike Added | % Recovery | Q |
|---------|-----------------|-------------|-------------|------------|---|
| Mercury | 7470A | 226 | 200 | 113% | |

Reported in ng/L

N-Control limit not met
Control Limits: 80-120%



Analytical Resources, Incorporated
Analytical Chemists and Consultants

December 10, 2009

Kent Angelos
Golder Associates, Inc.
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

RE: Boeing Plant 2 Source Control
ARI IDs: PY96 & PY97

Dear Kent:

Please find enclosed the original Chain of Custody (COC) records, sample receipt documentation, and the final data package for the project referenced above.

Sample receipt information and analytical details are addressed in the Case Narrative.

An electronic copy of this package will be kept on file at ARI. If you have any questions or require additional information, please contact me at your convenience.

Sincerely,
ANALYTICAL RESOURCES, INC.

Kelly Bottem
Client Services Manager
(206) 695-6211
kellyb@arilabs.com

KB/ej

cc: Kent Angelos, Golder Associates Inc., 18300 NE Union Hill Road, Suite 200,
Redmond, WA 98052-3333

Enclosures

Chain of Custody
Documentation

prepared
for

The Boeing Company

Project: BP2 Source Control

ARI JOB NO: PY96, PY97

prepared
by

Analytical Resources, Inc.

Analytical Resources, Incorporated
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)

| | |
|-------------------|-------------------|
| Page: 1 | of 1 |
| Date: 11/23/09 | Ice Present? Yes |
| No. of Coolers: 1 | Cooler Temps: 5.9 |

| | |
|--|--------------------------------------|
| ARI Assigned Number: PY96 | Turn-around Requested: 5da |
| ARI Client Company: BOEING | Phone: |
| Client Contact: WILL ERNST | |
| Client Project Name: BP2 Source Control | |
| Client Project #: | Samplers: Jill Lamberts, Liz Shea |

[illegible]

Limits of Liability: ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.



Analytical Resources,
Incorporated
Analytical Chemists and
Consultants

Cooler Receipt Form

ARI Client: Boeing

COC No(s): NA

Assigned ARI Job No: PY96

Project Name: BP2 Source Control

Delivered by: Fed-Ex UPS Courier Hand Delivered Other: _____

Tracking No: NA

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to cooler? YES NO

Were custody papers included with the cooler? YES NO

Were custody papers properly filled out (ink, signed, etc.) YES NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry) 5.9

If cooler temperature is out of compliance fill out form 00070F

Temp Gun ID#: 78941619

Cooler Accepted by: JW Date: 11/23/09 Time: 1515

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler? YES NO

What kind of packing material was used? ... Bubble Wrap Wet Ice Gel Packs Baggies Foam Block Paper Other: _____

Was sufficient ice used (if appropriate)? NA YES NO

Were all bottles sealed in individual plastic bags? YES NO

Did all bottles arrive in good condition (unbroken)? YES NO

Were all bottle labels complete and legible? YES NO

Did the number of containers listed on COC match with the number of containers received? YES NO

Did all bottle labels and tags agree with custody papers? YES NO

Were all bottles used correct for the requested analyses? YES NO

Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)... NA YES NO

Were all VOC vials free of air bubbles? NA YES NO

Was sufficient amount of sample sent in each bottle? YES NO

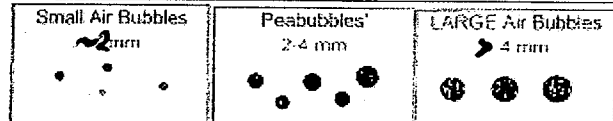
Samples Logged by: JW Date: 11/23/09 Time: 1630

**** Notify Project Manager of discrepancies or concerns ****

| Sample ID on Bottle | Sample ID on COC | Sample ID on Bottle | Sample ID on COC |
|---------------------|------------------|---------------------|------------------|
| | | | |
| | | | |
| | | | |
| | | | |

Additional Notes, Discrepancies, & Resolutions:

By: _____ Date: _____



Small → "sm"
Peabubbles → "pb"
Large → "lg"
Headspace → "hs"

PRESERVATION VERIFICATION 11/23/09

Page 1 of 1



ARI Job No: PY96

PC: Kelly
VTSR: 11/23/09

Inquiry Number: NONE
Analysis Requested: 11/24/09
Contact: Ernst, Will
Client: The Boeing Company
Logged by: JW
Sample Set Used: Yes-260
Validatable Package: No
Deliverables:

Project #:
Project: BP2 Source Control
Sample Site:
SDG No:
Analytical Protocol: In-house

| LOGNUM | CLIENT ID | CN | WAD | NH3 | COD | FOG | MET | PHEN | PHOS | TKN | NO23 | TOC | S2 | AK102 | Fe2+ | DMET DOC | FLT | FLT | PARAMETER | ADJUSTED TO | LOT NUMBER | AMOUNT ADDED | DATE/BY |
|----------|--------------------|-----|-----|-----|-----|-----|-----|------|------|-----|------|-----|----|-------|------|----------|-----|-----|-----------|-------------|------------|--------------|---------|
| 09-29068 | | >12 | >12 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | >9 | <2 | <2 | Y | | | | | | | |
| PY96A | PL2SC-W-EB3-112309 | | | | | | DIS | | | | | | | | | | | | | | | | |

Checked By JW Date 11/23/09

Chain of Custody Record & Laboratory Analysis Request

Analytical Resources, Incorporated
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)

| | |
|-------------------|-------------------|
| Page: 1 | of 1 |
| Date: 11/23/09 | Ice Present? Yes |
| No. of Coolers: 1 | Cooler Temps: 5.9 |

| | |
|--|--------------------------------------|
| ARI Assigned Number: PY97 | Turn-around Requested: 25 |
| ARI Client Company: Boeing | Phone: |
| Client Contact: WILL ERNST | |
| Client Project Name: BP2 Source Control | |
| Client Project #: | Samplers: Jill Lamberts, Liz Shea |

[illegible]

| Analysis Requested | | | | | Notes/Comments | | | |
|--------------------|---------|---------|---------------------------------|--|-----------------------------|--|--|-------------------------------|
| PCB | Diss MS | Diss 77 | | | | | | Metals samples field-filtered |
| X | X | X | | | | | | |
| | | | | | | | | |
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| | | | | | | | | |
| | | | | | | | | |
| JL 10/15 | | | Relinquished by: (Signature) | | Received by: (Signature) | | | |
| Thon Walter | | | Printed Name: | | Printed Name: | | | |
| | | | Company: | | Company: | | | |
| 09 15/15 | | | Date & Time: | | Date & Time: | | | |

Comments/Special Instructions

SmS metals
per QAPP
(see PM)

| | | | |
|---------------------------------|-----------------|-----------------------------|-----------------|
| Relinquished by: (Signature) | <i>J. J. J.</i> | Received by: (Signature) | <i>J. J. J.</i> |
| Printed Name: | <i>J. J. J.</i> | Printed Name: | <i>J. J. J.</i> |
| Company: | <i>Golden</i> | Company: | <i>AP</i> |
| Date & Time: | <i>-</i> | Date & Time: | <i>-</i> |

Relinquished by:
(Signature)
Printed Name:
Company:
Date & Time:

| | | | |
|--------------|---------------|----------|--------------|
| Received by: | Printed Name: | Company: | Date & Time: |
| (Signature) | | | |

Limits of Liability: ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the invoiced amount for services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.



Analytical Resources,
Incorporated
Analytical Chemists and
Consultants

Cooler Receipt Form

ARI Client: Beeing

COC No(s): _____

Assigned ARI Job No: PY97

Project Name: BP2 Source Control

Delivered by: Fed-Ex UPS Courier Hand Delivered Other: _____

Tracking No: _____

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to cooler? _____

YES NO

Were custody papers included with the cooler? _____

YES NO

Were custody papers properly filled out (ink, signed, etc.) _____

YES NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry)..... 5.9

If cooler temperature is out of compliance fill out form 00070F

Temp Gun ID#: 90941619

Cooler Accepted by: JW Date: 11/23/09 Time: 1515

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler? _____

YES NO

What kind of packing material was used? ... Bubble Wrap Wet Ice Gel Packs Baggies Foam Block Paper Other: _____

Was sufficient ice used (if appropriate)? _____

NA YES NO

Were all bottles sealed in individual plastic bags? _____

YES NO

Did all bottles arrive in good condition (unbroken)? _____

YES NO

Were all bottle labels complete and legible? _____

YES NO

Did the number of containers listed on COC match with the number of containers received? _____

YES NO

Did all bottle labels and tags agree with custody papers? _____

YES NO

Were all bottles used correct for the requested analyses? _____

YES NO

Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)...

NA YES NO

Were all VOC vials free of air bubbles? _____

NA YES NO

Was sufficient amount of sample sent in each bottle? _____

YES NO

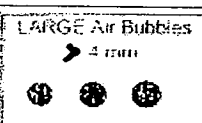
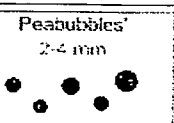
Samples Logged by: JW Date: 11/23/09 Time: 1630

**** Notify Project Manager of discrepancies or concerns ****

| Sample ID on Bottle | Sample ID on COC | Sample ID on Bottle | Sample ID on COC |
|---------------------|------------------|---------------------|------------------|
| | | | |
| | | | |
| | | | |
| | | | |

Additional Notes, Discrepancies, & Resolutions:

By: _____ Date: _____

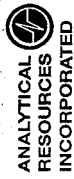


Small → "sm"

Peabubbles → "pb"

Large → "lg"

Headspace → "hs"



ARI Job No: PY97

PC: Kelly

VTSR: 11/23/09

Inquiry Number: NONE

Analysis Requested: 11/24/09

Contact: Ernst, Will

Client: The Boeing Company

Logged by: JW

Sample Set Used: Yes-260

Validatable Package: No

Deliverables:

Project #:

Project: BP2 Source Control

Sample Site:

SDG No:

Analytical Protocol: In-house

| LOGNUM | ARI ID | CLIENT ID | CN | WAD | NH3 | COD | FOG | MET | PHEN | PHOS | TKN | NO23 | TOC | S2 | AK102 | Fe2+ | DMET DOC | FLT | FLT | PARAMETER | ADJUSTED TO | LOT NUMBER | AMOUNT ADDED | DATE/BY |
|----------|--------|--------------------|-----|-----|-----|-----|-----|-----|------|------|-----|------|-----|----|-------|------|----------|-----|-----|-----------|-------------|------------|--------------|---------|
| 09-29069 | | | >12 | >12 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | >9 | <2 | <2 | Y | | | | | | | |
| PY97A | | PL2SC-W-EB3-112309 | | | | | | DIS | | | | | | | | | | | | | | | | |

Checked By JW Date 11/23/09

Case Narrative

prepared
for

The Boeing Company
Project: BP2 Source Control

ARI JOB NO: PY96, PY97

prepared
by

Analytical Resources, Inc.



Case Narrative

Project: Boeing Plant 2 Source Control

ARI IDs: PY96 & PY97

Matrix: Water

Date: December 9, 2009

Sample Receipt Information

One water sample was received in good condition at Analytical Resources, Inc. (ARI) on November 23, 2009 under ARI sample delivery groups (SDGs) PY96 and PY97. The cooler temperature, as measured by IR thermometer, was 5.9°C. For further details regarding sample receipt, please refer to the enclosed Cooler Receipt Form and Preservation Verification sheet.

The sample was analyzed for the parameters listed below, as requested on the Chain of Custody.

PCBs by Method 8082:

The sample was extracted on 11/25/09 and analyzed on 11/28/09 within the method recommended holding times.

Initial calibration (s): All analytes of interest were within method acceptance criteria.

Continuing calibration (s): Are in control.

Samples: There were no anomalies associated with this sample.

Surrogates: All surrogate recoveries were in control.

LCS(s): All percent recoveries for the analytes of interest were within compliance.

Method Blank: The method blank was free of contamination.

Dissolved Metals by Methods 6010B and 7000 series

The sample was digested on 11/24/09. The digest was analyzed between 11/30/09 and 12/07/09 within the method recommended holding times.

Samples: No anomalies were encountered for this sample.

LCS/Blank Spike(s): All percent recoveries were within compliance.

Method Blank(s): Were in control.

Dissolved Low-Level Mercury by Method SW7470A

The sample was digested on 11/24/09. The digest was analyzed on 12/03/09 within the method recommended holding times.



Case Narrative

Project: Boeing Plant 2 Source Control

ARI IDs: PY96 & PY97

Matrix: Water

Date: December 9, 2009

Samples: No anomalies were encountered for this sample.

LCS/Blank Spike(s): All percent recoveries were within compliance.

Method Blank(s): Were in control.



Data Reporting Qualifiers

Effective 7/10/2009

Inorganic Data

- U Indicates that the target analyte was not detected at the reported concentration
- * Duplicate RPD is not within established control limits
- B Reported value is less than the CRDL but \geq the Reporting Limit
- N Matrix Spike recovery not within established control limits
- NA Not Applicable, analyte not spiked
- H The natural concentration of the spiked element is so much greater than the concentration spiked that an accurate determination of spike recovery is not possible
- L Analyte concentration is ≤ 5 times the Reporting Limit and the replicate control limit defaults to ± 1 RL instead of the normal 20% RPD

Organic Data

- U Indicates that the target analyte was not detected at the reported concentration
- * Flagged value is not within established control limits
- B Analyte detected in an associated Method Blank at a concentration greater than one-half of ARI's Reporting Limit or 5% of the regulatory limit or 5% of the analyte concentration in the sample.
- J Estimated concentration when the value is less than ARI's established reporting limits
- D The spiked compound was not detected due to sample extract dilution
- E Estimated concentration calculated for an analyte response above the valid instrument calibration range. A dilution is required to obtain an accurate quantification of the analyte.
- Q Indicates a detected analyte with an initial or continuing calibration that does not meet established acceptance criteria ($<20\%$ RSD, $<20\%$ Drift or minimum RRF).
- S Indicates an analyte response that has saturated the detector. The calculated concentration is not valid; a dilution is required to obtain valid quantification of the analyte



- NA The flagged analyte was not analyzed for
- NR Spiked compound recovery is not reported due to chromatographic interference
- NS The flagged analyte was not spiked into the sample
- M Estimated value for an analyte detected and confirmed by an analyst but with low spectral match parameters. This flag is used only for GC-MS analyses
- M2 The sample contains PCB congeners that do not match any standard Aroclor pattern. The PCBs are identified and quantified as the Aroclor whose pattern most closely matches that of the sample. The reported value is an estimate.
- N The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification"
- Y The analyte is not detected at or above the reported concentration. The reporting limit is raised due to chromatographic interference. The Y flag is equivalent to the U flag with a raised reporting limit.
- C The analyte was positively identified on only one of two chromatographic columns. Chromatographic interference prevented a positive identification on the second column
- P The analyte was detected on both chromatographic columns but the quantified values differ by $\geq 40\%$ RPD with no obvious chromatographic interference

Geotechnical Data

- A The total of all fines fractions. This flag is used to report total fines when only sieve analysis is requested and balances total grain size with sample weight.
- F Samples were frozen prior to particle size determination
- SM Sample matrix was not appropriate for the requested analysis. This normally refers to samples contaminated with an organic product that interferes with the sieving process and/or moisture content, porosity and saturation calculations
- SS Sample did not contain the proportion of "fines" required to perform the pipette portion of the grain size analysis
- W Weight of sample in some pipette aliquots was below the level required for accurate weighting



Spike Recovery Control Limits Analysis of PCB / Aroclors in Aqueous Samples - EPA SW-846 Methods 8081 & 8082^(1,2)

Effective 5/1/09

Control limits are updated periodically. Assure that you have ARI's current control limits by downloading the files at the time of use. <http://www.arilabs.com/portal/downloads/ARI-CLs.zip>

| Analytical Method: | Standard Analysis | MTCA Analysis | Low Level Analysis | Manchester Extraction |
|---|-------------------|-----------------|--------------------|-------------------------|
| Sample Weight / Final Volume: | 500 / 5 mL | 500 / 1 mL | 1000 / 0.5 mL | 3000 / 1 mL |
| LCS Spike Recovery ⁽⁴⁾ | | | | |
| Aroclor 1016 | 45 - 121 | 36 - 100 | 44 - 117 | 30 - 160 ⁽³⁾ |
| Aroclor 1260 | 54 - 129 | 41 - 113 | 46 - 131 | 30 - 160 ⁽³⁾ |
| | | | | |
| Method Blank/LCS Surrogate Recovery | | | | |
| Tetrachloro- <i>meta</i> -xylene (TCMX) | 40 - 118 | 29 - 100 | 31 - 100 | 30 - 160 ⁽³⁾ |
| Decachlorobiphenyl | 41 - 111 | 35 - 116 | 32 - 108 | 30 - 160 ⁽³⁾ |
| | | | | |
| Sample Surrogate Recovery | | | | |
| Tetrachloro- <i>meta</i> -xylene (TCMX) | 38 - 118 | 25 - 100 | 21 - 100 | 30 - 160 ⁽³⁾ |
| Decachlorobiphenyl | 29 - 118 | 10 - 128 | 19 - 111 | 30 - 160 ⁽³⁾ |

(1) Control Limits calculated using all data generated 1/1/08 through 12/1/08.

(2) Highlighted control limits (**bold font**) adjusted to demonstrate that ARI does not use control limits < 10 for the lower limit or < 100 for the upper limit.

(3) 30 - 160 are default, advisory control limits used when there is insufficient data to calculate historic control limits. **DO NOT** use these limits as the sole reason to reject the data from a batch of analyses.

(4) Laboratory Control Sample (LCS) spike recovery control limits also used as advisory control limits for sample matrix spike (MS) analyzes. MS recovery values are advisory and not used to assess the acceptability of an analytical batch.



Summary of Laboratory Control Limits Metals Analyses (All Methods & Sample Matrices)

Effective 5/1/09

Control limits are updated periodically. Assure that you have ARI's current control limits by downloading the files at the time of use. <http://www.arilabs.com/portal/downloads/ARI-CLs.zip>

| Element | Matrix Spike Recovery | LCS Recovery | Replicate RPD |
|-----------|-----------------------|--------------|---------------|
| Aluminum | 75 - 125 | 80 - 120 | ≤ 20% |
| Antimony | 75 - 125 | 80 - 120 | ≤ 20% |
| Arsenic | 75 - 125 | 80 - 120 | ≤ 20% |
| Barium | 75 - 125 | 80 - 120 | ≤ 20% |
| Beryllium | 75 - 125 | 80 - 120 | ≤ 20% |
| Boron | 75 - 125 | 80 - 120 | ≤ 20% |
| Cadmium | 75 - 125 | 80 - 120 | ≤ 20% |
| Calcium | 75 - 125 | 80 - 120 | ≤ 20% |
| Chromium | 75 - 125 | 80 - 120 | ≤ 20% |
| Cobalt | 75 - 125 | 80 - 120 | ≤ 20% |
| Copper | 75 - 125 | 80 - 120 | ≤ 20% |
| Iron | 75 - 125 | 80 - 120 | ≤ 20% |
| Lead | 75 - 125 | 80 - 120 | ≤ 20% |
| Magnesium | 75 - 125 | 80 - 120 | ≤ 20% |
| Manganese | 75 - 125 | 80 - 120 | ≤ 20% |
| Mercury | 75 - 125 | 80 - 120 | ≤ 20% |
| Nickel | 75 - 125 | 80 - 120 | ≤ 20% |
| Potassium | 75 - 125 | 80 - 120 | ≤ 20% |
| Selenium | 75 - 125 | 80 - 120 | ≤ 20% |
| Silica | 75 - 125 | 80 - 120 | ≤ 20% |
| Silver | 75 - 125 | 80 - 120 | ≤ 20% |
| Sodium | 75 - 125 | 80 - 120 | ≤ 20% |
| Strontium | 75 - 125 | 80 - 120 | ≤ 20% |
| Thallium | 75 - 125 | 80 - 120 | ≤ 20% |
| Vanadium | 75 - 125 | 80 - 120 | ≤ 20% |
| Zinc | 75 - 125 | 80 - 120 | ≤ 20% |

Data Summary Package

prepared
for

The Boeing Company

Project: BP2 Source Control

ARI JOB NO: PY96, PY97

prepared
by

Analytical Resources, Inc.

PCB ANALYSIS

ORGANICS ANALYSIS DATA SHEET

PCB by GC/ECD Method SW8082

Page 1 of 1

ANALYTICAL
RESOURCES
INCORPORATED 


Sample ID: PL2SC-W-EB3-112309

SAMPLE

Lab Sample ID: PY96A

LIMS ID: 09-29068

Matrix: Water

Data Release Authorized: 

Reported: 11/30/09

QC Report No: PY96-The Boeing Company

Project: BP2 Source Control

Date Sampled: 11/23/09

Date Received: 11/23/09

Date Extracted: 11/25/09

Date Analyzed: 11/28/09 13:55

Instrument/Analyst: ECD5/JGR

GPC Cleanup: No

Sulfur Cleanup: No

Sample Amount: 500 mL

Final Extract Volume: 5.0 mL

Dilution Factor: 1.00

Silica Gel: No

Acid Cleanup: No

| CAS Number | Analyte | RL | Result |
|------------|--------------|-----|---------|
| 12674-11-2 | Aroclor 1016 | 1.0 | < 1.0 U |
| 53469-21-9 | Aroclor 1242 | 1.0 | < 1.0 U |
| 12672-29-6 | Aroclor 1248 | 1.0 | < 1.0 U |
| 11097-69-1 | Aroclor 1254 | 1.0 | < 1.0 U |
| 11096-82-5 | Aroclor 1260 | 1.0 | < 1.0 U |
| 11104-28-2 | Aroclor 1221 | 1.0 | < 1.0 U |
| 11141-16-5 | Aroclor 1232 | 1.0 | < 1.0 U |

Reported in $\mu\text{g/L}$ (ppb)

PCB Surrogate Recovery

| | |
|-----------------------|-------|
| Decachlorobiphenyl | 71.5% |
| Tetrachlorometaxylene | 86.5% |

SW8082/PCB WATER SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: PY96-The Boeing Company
Project: BP2 Source Control

| Client ID | DCBP % REC | DCBP LCL-UCL | TCMX % REC | TCMX LCL-UCL | TOT OUT |
|--------------------|---------------|-----------------|---------------|-----------------|---------|
| MB-112509 | 95.0% | 41-111 | 78.0% | 40-118 | 0 |
| LCS-112509 | 106% | 41-111 | 88.8% | 40-118 | 0 |
| LCSD-112509 | 104% | 41-111 | 80.8% | 40-118 | 0 |
| PL2SC-W-EB3-112309 | 71.5% | 29-118 | 86.5% | 38-118 | 0 |

Prep Method: SW3510C
Log Number Range: 09-29068 to 09-29068

ORGANICS ANALYSIS DATA SHEET

PCB by GC/ECD Method SW8082

Page 1 of 1


Sample ID: LCS-112509

LCS/LCSD

Lab Sample ID: LCS-112509

LIMS ID: 09-29068

Matrix: Water

Data Release Authorized: 

Reported: 11/30/09

QC Report No: PY96-The Boeing Company

Project: BP2 Source Control

Date Sampled: NA

Date Received: NA

Date Extracted LCS/LCSD: 11/25/09

Sample Amount LCS: 500 mL

LCSD: 500 mL

Date Analyzed LCS: 11/28/09 12:50

Final Extract Volume LCS: 5.0 mL

LCSD: 11/28/09 13:12

LCSD: 5.0 mL

Instrument/Analyst LCS: ECD5/JGR

Dilution Factor LCS: 1.00

LCSD: ECD5/JGR

LCSD: 1.00

GPC Cleanup: No

Silica Gel: No

Sulfur Cleanup: No

Acid Cleanup: No

| Analyte | LCS | | | LCSD | | | RPD |
|--------------|------|-----------------|--------------|------|------------------|---------------|------|
| | LCS | Spike Added-LCS | LCS Recovery | LCSD | Spike Added-LCSD | LCSD Recovery | |
| Aroclor 1016 | 5.82 | 5.00 | 116% | 5.56 | 5.00 | 111% | 4.6% |
| Aroclor 1260 | 5.77 | 5.00 | 115% | 5.80 | 5.00 | 116% | 0.5% |

PCB Surrogate Recovery

| | LCS | LCSD |
|-----------------------|-------|-------|
| Decachlorobiphenyl | 106% | 104% |
| Tetrachlorometaxylene | 88.8% | 80.8% |

Results reported in $\mu\text{g/L}$

RPD calculated using sample concentrations per SW846.

4
PCB METHOD BLANK SUMMARY

BLANK NO.

PZ35MBW1

Lab Name: ANALYTICAL RESOURCES, INC

Client: BOEING

ARI Job No.: PY96

Project: PL2DS PLANT 2 2-40 B

Lab Sample ID: PZ35MBW1

Lab File ID: 1126B141

Date Extracted: 11/25/09

Matrix: LIQUID

Date Analyzed: 11/28/09

Instrument ID: ECD5

Time Analyzed: 1146

GC Columns: ZB5/ZB35

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

| | CLIENT SAMPLE NO. ===== | LAB SAMPLE ID ===== | DATE ANALYZED ===== |
|----|-------------------------------|---------------------------|---------------------------|
| 01 | PZ35LCSW1 | PZ35LCSW1 | 11/28/09 |
| 02 | PZ35LCSDW1 | PZ35LCSDW1 | 11/28/09 |
| 03 | PL2SC-W-EB3-112309 | PY96A | 11/28/09 |

ALL RUNS ARE DUAL COLUMN

ORGANICS ANALYSIS DATA SHEET

PCB by GC/ECD Method SW8082

Page 1 of 1


Sample ID: MB-112509

METHOD BLANK

Lab Sample ID: MB-112509

LIMS ID: 09-29068

Matrix: Water

Data Release Authorized: 

Reported: 11/30/09

QC Report No: PY96-The Boeing Company

Project: BP2 Source Control

Date Sampled: NA

Date Received: NA

Date Extracted: 11/25/09

Date Analyzed: 11/28/09 11:46

Instrument/Analyst: ECD5/JGR

GPC Cleanup: No

Sulfur Cleanup: No

Sample Amount: 500 mL

Final Extract Volume: 5.0 mL

Dilution Factor: 1.00

Silica Gel: No

Acid Cleanup: No

| CAS Number | Analyte | RL | Result |
|------------|--------------|-----|---------|
| 12674-11-2 | Aroclor 1016 | 1.0 | < 1.0 U |
| 53469-21-9 | Aroclor 1242 | 1.0 | < 1.0 U |
| 12672-29-6 | Aroclor 1248 | 1.0 | < 1.0 U |
| 11097-69-1 | Aroclor 1254 | 1.0 | < 1.0 U |
| 11096-82-5 | Aroclor 1260 | 1.0 | < 1.0 U |
| 11104-28-2 | Aroclor 1221 | 1.0 | < 1.0 U |
| 11141-16-5 | Aroclor 1232 | 1.0 | < 1.0 U |

Reported in $\mu\text{g/L}$ (ppb)

PCB Surrogate Recovery

| | |
|-----------------------|-------|
| Decachlorobiphenyl | 95.0% |
| Tetrachlorometaxylene | 78.0% |

METALS ANALYSIS

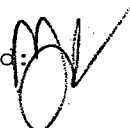
INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS
Page 1 of 1

Sample ID: PL2SC-W-EB3-112309
SAMPLE

Lab Sample ID: PY96A

LIMS ID: 09-29068

Matrix: Water

Data Release Authorized: 

Reported: 12/08/09

QC Report No: PY96-The Boeing Company
Project: BP2 Source Control

Date Sampled: 11/23/09

Date Received: 11/23/09

| Prep Meth | Prep Date | Analysis Method | Analysis Date | CAS Number | Analyte | RL | µg/L | Q |
|--------------|--------------|--------------------|------------------|------------|----------|-----|------|---|
| 200.8 | 11/24/09 | 200.8 | 11/30/09 | 7440-38-2 | Arsenic | 0.2 | 0.2 | U |
| 6010B | 11/24/09 | 6010B | 12/07/09 | 7440-43-9 | Cadmium | 2 | 2 | U |
| 6010B | 11/24/09 | 6010B | 12/07/09 | 7440-47-3 | Chromium | 5 | 5 | U |
| 6010B | 11/24/09 | 6010B | 12/07/09 | 7440-50-8 | Copper | 2 | 2 | U |
| 200.8 | 11/24/09 | 200.8 | 11/30/09 | 7439-92-1 | Lead | 1 | 1 | U |
| 6010B | 11/24/09 | 6010B | 12/07/09 | 7440-22-4 | Silver | 3 | 3 | U |
| 6010B | 11/24/09 | 6010B | 12/07/09 | 7440-66-6 | Zinc | 10 | 10 | |

U-Analyte undetected at given RL
RL-Reporting Limit

INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS
Page 1 of 1

Sample ID: LAB CONTROL

Lab Sample ID: PY96LCS

LIMS ID: 09-29068

Matrix: Water

Data Release Authorized:

Reported: 12/08/09

QC Report No: PY96-The Boeing Company

Project: BP2 Source Control

Date Sampled: NA

Date Received: NA

BLANK SPIKE QUALITY CONTROL REPORT

| Analyte | Analysis Method | Spike Found | Spike Added | % Recovery | Q |
|----------|-----------------|-------------|-------------|------------|---|
| Arsenic | 200.8 | 26.4 | 25.0 | 106% | |
| Cadmium | 6010B | 538 | 500 | 108% | |
| Chromium | 6010B | 515 | 500 | 103% | |
| Copper | 6010B | 485 | 500 | 97.0% | |
| Lead | 200.8 | 25 | 25 | 100% | |
| Silver | 6010B | 540 | 500 | 108% | |
| Zinc | 6010B | 500 | 500 | 100% | |

Reported in µg/L

N-Control limit not met

Control Limits: 80-120%

INORGANICS ANALYSIS DATA SHEET

DISSOLVED METALS

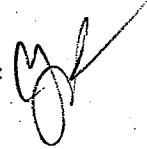
Page 1 of 1

Sample ID: METHOD BLANK

Lab Sample ID: PY96MB

LIMS ID: 09-29068

Matrix: Water

Data Release Authorized: 

Reported: 12/08/09

QC Report No: PY96-The Boeing Company

Project: BP2 Source Control

Date Sampled: NA

Date Received: NA

| Prep Meth | Prep Date | Analysis Method | Analysis Date | CAS Number | Analyte | RL | µg/L | Q |
|-----------|-----------|-----------------|---------------|------------|----------|-----|------|---|
| 200.8 | 11/24/09 | 200.8 | 11/30/09 | 7440-38-2 | Arsenic | 0.2 | 0.2 | U |
| 6010B | 11/24/09 | 6010B | 12/07/09 | 7440-43-9 | Cadmium | 2 | 2 | U |
| 6010B | 11/24/09 | 6010B | 12/07/09 | 7440-47-3 | Chromium | 5 | 5 | U |
| 6010B | 11/24/09 | 6010B | 12/07/09 | 7440-50-8 | Copper | 2 | 2 | U |
| 200.8 | 11/24/09 | 200.8 | 11/30/09 | 7439-92-1 | Lead | 1 | 1 | U |
| 6010B | 11/24/09 | 6010B | 12/07/09 | 7440-22-4 | Silver | 3 | 3 | U |
| 6010B | 11/24/09 | 6010B | 12/07/09 | 7440-66-6 | Zinc | 10 | 10 | U |


U-Analyte undetected at given RL

RL-Reporting Limit

MERCURY ANALYSIS

INORGANICS ANALYSIS DATA SHEET
Dissolved Mercury by Method SW7470A

ANALYTICAL
RESOURCES
INCORPORATED 

Data Release Authorized: 
Reported: 12/04/09
Date Received: 11/23/09
Page 1 of 1

QC Report No: PY97-The Boeing Company
Project: BP2 Source Control

| Client/ ARI ID | Date Sampled | Matrix | Prep Date Anal Date | RL | Result |
|--------------------------------------|-----------------|--------|------------------------|------|--------|
| PL2SC-W-EB3-112309 PY97A 09-29069 | 11/23/09 | Water | 11/24/09 12/03/09 | 20.0 | 20.0 U |
| MB-112409 Method Blank | NA | Water | 11/24/09 12/03/09 | 20.0 | 20.0 U |

Reported in ng/L

RL-Analytical reporting limit
U-Undetected at reported detection limit

INORGANICS ANALYSIS DATA SHEET

DISSOLVED METALS

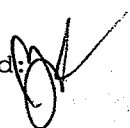
Page 1 of 1

Sample ID: LAB CONTROL

Lab Sample ID: PY97LCS

LIMS ID: 09-29069

Matrix: Water

Data Release Authorized: 

Reported: 12/04/09

QC Report No: PY97-The Boeing Company

Project: BP2 Source Control

Date Sampled: NA

Date Received: NA

BLANK SPIKE QUALITY CONTROL REPORT

| Analyte | Analysis Method | Spike Found | Spike Added | % Recovery | Q |
|---------|-----------------|-------------|-------------|------------|---|
| Mercury | 7470A | 162 | 200 | 81.0% | |

Reported in ng/L

N-Control limit not met

Control Limits: 80-120%



Analytical Resources, Incorporated
Analytical Chemists and Consultants

January 4, 2010

Kent Angelos
Golder Associates, Inc.
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

RE: Boeing Plant 2 Source Control
ARI IDs: QC17 & QC18

Dear Kent:

Please find enclosed the original Chain of Custody (COC) records, sample receipt documentation, and the final data package for the project referenced above.

Sample receipt information and analytical details are addressed in the Case Narrative.

An electronic copy of this package will be kept on file at ARI. If you have any questions or require additional information, please contact me at your convenience.

Sincerely,
ANALYTICAL RESOURCES, INC.

Kelly Bottem
Client Services Manager
(206) 695-6211
kellyb@arilabs.com

KB/kb

cc: Kent Angelos, Golder Associates Inc., 18300 NE Union Hill Road, Suite 200,
Redmond, WA 98052-3333

Enclosures

Chain of Custody
Documentation

prepared
for

The Boeing Company

Project: BP2SC

ARI JOB NO: QC17, QC18

prepared
by

Analytical Resources, Inc.

Analytical Resources, Incorporated
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)

| | |
|-------------------|--|
| Page: 1 | of 1 |
| Date: | Ice Present? <input checked="" type="checkbox"/> |
| No. of Coolers: 1 | Cooler Temps: 2.9 |

| | | | |
|----------------------|------------|------------------------|------------------------|
| ARI Assigned Number: | 0017 | Turn-around Requested: | Std |
| ARI Client Company: | Boeing | Phone: | |
| Client Contact: | Will ERNST | | |
| Client Project Name: | 602 SC | | |
| Client Project #: | | Samplers: | 217 Shea Will Lamberts |

[illegible]

Limits of Liability: ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.



Cooler Receipt Form

ARI Client: Boeing

Project Name: BP2 SC

COC No(s): _____ (NA)

Delivered by: Fed-Ex UPS Courier Hand Delivered Other: _____

Assigned ARI Job No: QC17

Tracking No: _____ (NA)

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to cooler? YES (NO)

Were custody papers included with the cooler? (YES) NO

Were custody papers properly filled out (ink, signed, etc.) (YES) NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry)..... 2.9

If cooler temperature is out of compliance fill out form 00070F Temp Gun ID#: 90877952

Cooler Accepted by: AV Date: 12/18/09 Time: 1523

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler? YES (NO)

What kind of packing material was used? ... Bubble Wrap Wet Ice Gel Packs Baggies Foam Block Paper Other: _____

Was sufficient ice used (if appropriate)? NA (YES) NO

Were all bottles sealed in individual plastic bags? YES (NO)

Did all bottles arrive in good condition (unbroken)? (YES) NO

Were all bottle labels complete and legible? (YES) NO

Did the number of containers listed on COC match with the number of containers received? (YES) NO

Did all bottle labels and tags agree with custody papers? (YES) NO

Were all bottles used correct for the requested analyses? (YES) NO

Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)... NA (YES) NO

Were all VOC vials free of air bubbles? (NA) (YES) NO

Was sufficient amount of sample sent in each bottle? (YES) NO

Date VOC Trip Blank was made at ARI (NA)

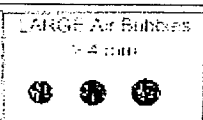
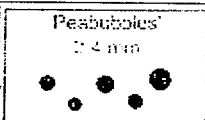
Samples Logged by: AV Date: 12/18/09 Time: 1635

**** Notify Project Manager of discrepancies or concerns ****

| Sample ID on Bottle | Sample ID on COC | Sample ID on Bottle | Sample ID on COC |
|---------------------|------------------|---------------------|------------------|
| | | | |
| | | | |
| | | | |
| | | | |

Additional Notes, Discrepancies, & Resolutions:

By: _____ Date: _____



Small → "sm"

Peabubbles → "pb"

Large → "lg"

Headspace → "hs"



ARI Job No: QC17
PC: Kelly
VTSR: 12/18/09

Inquiry Number: NONE
Analysis Requested: 12/19/09
Contact: Ernst, Will
Client: The Boeing Company
Logged by: AV
Sample Set Used: Yes-481
Validatable Package: ~~NA~~ Yes
Deliverables:

Project #:
Project: BP2SC
Sample Site:
SDG No:
Analytical Protocol: In-house

| LOGNUM | CLIENT ID | CN | WAD | NH3 | COD | FOG | MET | PHEN | PHOS | TKN | NO23 | TOC | S2 | AK102 | Fe2+ | DMET DOC | FLT | FLT | PARAMETER | ADJUSTED TO | LOT NUMBER | AMOUNT ADDED | DATE/EY |
|----------|------------------|-----|-----|-----|-----|-----|-----|------|------|-----|------|-----|----|-------|------|----------|-----|-----|-----------|-------------|------------|--------------|---------|
| 09-31206 | | >12 | >12 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | >9 | <2 | <2 | Y | | | | | | | |
| QC17A | PL2SC-EE2-121809 | | | | | | DIS | | | | | | | | | | | | | | | | |

Checked By AV Date 12/18/09

Chain of Custody Record & Laboratory Analysis Request

| | | |
|--------------------------------------|--------------------------------------|--|
| ARI Assigned Number: Q18 | Turn-around Requested: Std | Page: 1 of 1 |
| ARI Client Company: Boeing | Phone: | Date: Y Ice Present? |
| Client Contact: Will Ernst | | No. of Coolers: 1 Cooler Temps: 2.9 |

Analytical Resources, Incorporated
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)

[illegible]

Limits of Liability: ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.



Cooler Receipt Form

ARI Client: Boeing

Project Name: BP2 SC

COC No(s): _____ (NA)

Delivered by: Fed-Ex UPS Courier Hand Delivered Other: _____

Assigned ARI Job No: QC18

Tracking No: _____ (NA)

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to cooler? YES (NO)

Were custody papers included with the cooler? YES NO

Were custody papers properly filled out (ink, signed, etc.) YES NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry) 2.9

If cooler temperature is out of compliance fill out form 00070F

Temp Gun ID#: 90877952

Cooler Accepted by: AV Date: 12/18/09 Time: 1523

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler? YES (NO)

What kind of packing material was used? ... Bubble Wrap (Wet Ice) Gel Packs Baggies Foam Block Paper Other: _____

Was sufficient ice used (if appropriate)? NA YES NO

Were all bottles sealed in individual plastic bags? YES (NO)

Did all bottles arrive in good condition (unbroken)? YES NO

Were all bottle labels complete and legible? YES NO

Did the number of containers listed on COC match with the number of containers received? YES NO

Did all bottle labels and tags agree with custody papers? YES NO

Were all bottles used correct for the requested analyses? YES NO

Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)... NA YES NO

Were all VOC vials free of air bubbles? NA YES NO

Was sufficient amount of sample sent in each bottle? YES NO

Date VOC Trip Blank was made at ARI: NA

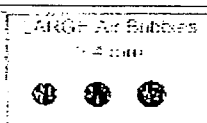
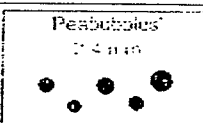
Samples Logged by: JP Date: 12/18/09 Time: 1640

** Notify Project Manager of discrepancies or concerns **

| Sample ID on Bottle | Sample ID on COC | Sample ID on Bottle | Sample ID on COC |
|---------------------|------------------|---------------------|------------------|
| | | | |
| | | | |
| | | | |
| | | | |

Additional Notes, Discrepancies, & Resolutions:

By: _____ Date: _____



Small → "sm"

Peabubbles → "pb"

Large → "lg"

Headspace → "hs"



ARI Job No: QC18

PC: Kelly
VTSR: 12/18/09

Inquiry Number: NONE
Analysis Requested: 12/18/09
Contact: Ernst, Will
Client: The Boeing Company
Logged by: JP
Sample Set Used: Yes-481
Validatable Package: No
Deliverables:

Project #:
Project: BP2SC
Sample Site:
SDG No:
Analytical Protocol: In-house

| LOGNUM | CLIENT ID | CN | WAD | NH3 | COD | FOG | MET | PHEN | PHOS | TKN | NO23 | TOC | S2 | AK102 | Fe2+ | DMET DOC | FLT | FLT | PARAMETER | ADJUSTED TO | LOT NUMBER | AMOUNT ADDED | DATE/BY |
|----------|------------------|-----|-----|-----|-----|-----|-----|------|------|-----|------|-----|----|-------|------|----------|-----|-----|-----------|-------------|------------|--------------|---------|
| 09-31207 | | >12 | >12 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | >9 | <2 | <2 | Y | | | | | | | |
| QC18A | PL2SC-EB2-121809 | | | | | | DIS | | | | | | | | | | | | | | | | |

Checked By JP Date 12/18/09

Case Narrative

prepared
for

The Boeing Company

Project: BP2SC

ARI JOB NO: QC17, QC18

prepared
by

Analytical Resources, Inc.



Case Narrative

Project: Boeing Plant 2 Source Control

ARI IDs: QC17 & QC18

Matrix: Water

Date: January 4, 2010

Sample Receipt Information

One water sample was received in good condition at Analytical Resources, Inc. (ARI) on December 18, 2009 under ARI sample delivery groups (SDGs) QC17 and QC18. The cooler temperature, as measured by IR thermometer, was 2.9°C. For further details regarding sample receipt, please refer to the enclosed Cooler Receipt Form and Preservation Verification sheet.

The sample was analyzed for the parameters listed below, as requested on the Chain of Custody.

PCBs by Method 8082:

The sample was extracted on 12/22/09 and analyzed on 12/24/09 within the method recommended holding times.

Initial calibration (s): All analytes of interest were within method acceptance criteria.

Continuing calibration (s): Are in control.

Samples: There were no anomalies associated with this sample.

Surrogates: All surrogate recoveries were in control.

LCS(s): All percent recoveries for the analytes of interest were within compliance.

Method Blank: The method blank was free of contamination.

Dissolved Metals by Methods 6010B and 7000 series

The sample was digested on 12/23/09. The digest was analyzed between 12/29/09 and 12/30/09 within the method recommended holding times.

Samples: No anomalies were encountered for this sample.

LCS/Blank Spike(s): All percent recoveries were within compliance.

Method Blank(s): Were in control.

Dissolved Low-Level Mercury by Method SW7470A

The sample was digested on 12/22/09. The digest was analyzed on 12/22/09 within the method recommended holding times.



Case Narrative

Project: Boeing Plant 2 Source Control

ARI IDs: QC17 & QC18

Matrix: Water

Date: January 4, 2010

Samples: No anomalies were encountered for this sample.

LCS/Blank Spike(s): All percent recoveries were within compliance.

Method Blank(s): Were in control.



Data Reporting Qualifiers

Effective 7/10/2009

Inorganic Data

- U Indicates that the target analyte was not detected at the reported concentration
- * Duplicate RPD is not within established control limits
- B Reported value is less than the CRDL but \geq the Reporting Limit
- N Matrix Spike recovery not within established control limits
- NA Not Applicable, analyte not spiked
- H The natural concentration of the spiked element is so much greater than the concentration spiked that an accurate determination of spike recovery is not possible
- L Analyte concentration is ≤ 5 times the Reporting Limit and the replicate control limit defaults to ± 1 RL instead of the normal 20% RPD

Organic Data

- U Indicates that the target analyte was not detected at the reported concentration
- * Flagged value is not within established control limits
- B Analyte detected in an associated Method Blank at a concentration greater than one-half of ARI's Reporting Limit or 5% of the regulatory limit or 5% of the analyte concentration in the sample.
- J Estimated concentration when the value is less than ARI's established reporting limits
- D The spiked compound was not detected due to sample extract dilution
- E Estimated concentration calculated for an analyte response above the valid instrument calibration range. A dilution is required to obtain an accurate quantification of the analyte.
- Q Indicates a detected analyte with an initial or continuing calibration that does not meet established acceptance criteria ($< 20\%$ RSD, $< 20\%$ Drift or minimum RRF).
- S Indicates an analyte response that has saturated the detector. The calculated concentration is not valid; a dilution is required to obtain valid quantification of the analyte



Data Reporting Qualifiers

Effective 7/10/2009

- NA The flagged analyte was not analyzed for
- NR Spiked compound recovery is not reported due to chromatographic interference
- NS The flagged analyte was not spiked into the sample
- M Estimated value for an analyte detected and confirmed by an analyst but with low spectral match parameters. This flag is used only for GC-MS analyses
- M2 The sample contains PCB congeners that do not match any standard Aroclor pattern. The PCBs are identified and quantified as the Aroclor whose pattern most closely matches that of the sample. The reported value is an estimate.
- N The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification"
- Y The analyte is not detected at or above the reported concentration. The reporting limit is raised due to chromatographic interference. The Y flag is equivalent to the U flag with a raised reporting limit.
- C The analyte was positively identified on only one of two chromatographic columns. Chromatographic interference prevented a positive identification on the second column
- P The analyte was detected on both chromatographic columns but the quantified values differ by $\geq 40\%$ RPD with no obvious chromatographic interference

Geotechnical Data

- A The total of all fines fractions. This flag is used to report total fines when only sieve analysis is requested and balances total grain size with sample weight.
- F Samples were frozen prior to particle size determination
- SM Sample matrix was not appropriate for the requested analysis. This normally refers to samples contaminated with an organic product that interferes with the sieving process and/or moisture content, porosity and saturation calculations
- SS Sample did not contain the proportion of "fines" required to perform the pipette portion of the grain size analysis
- W Weight of sample in some pipette aliquots was below the level required for accurate weighting

LCS SOLUTIONS

11/06/2009

| LABL | SOLN ID | TEST | CONC. UG/ML | SOLVENT | EXP. |
|------|---------|--------------|-------------|---------|----------|
| 1 | 1667-4 | PCB | 20 | ACETONE | 10/29/10 |
| 2# | 1472-3 | BCOC PEST | 10 | ACETONE | NA |
| 3 | 1620-4 | PEST | 02/04/20 | ACETONE | 06/26/10 |
| 4 | 1667-1 | LOW PEST | 0.2/0.4/2 | ACETONE | 06/26/10 |
| 5 | 1580-2 | EPH | 1500 | MECL2 | 01/29/10 |
| 6 | 1655-3 | PCP | 12.5/125 | ACETONE | 09/24/10 |
| 7 | 1635-1 | ABN | 100 | ACETONE | 02/01/10 |
| 8 | 1566-1 | TBT | 2.5 | MECL2 | 12/04/09 |
| 9 | 1567-3 | PORE TBT | .125/.25 | MECL2 | 12/04/09 |
| 10 | 1621-4 | ABN ACID | 100/200 | MEOH | 07/14/10 |
| 11 | 1642-2 | TPHD | 15000 | ACETONE | 09/07/10 |
| 12 | 1622-2 | ABN BASE | 200 | ACETONE | 02/05/10 |
| 13 | 1613-1 | LOW PCB | 2 | ACETONE | 06/08/10 |
| 14* | 1547-1 | LOW ABN ACID | 10/20 | MEOH | 04/10/10 |
| 15* | 1591-3 | SIM PNA | 15/75 | MEOH | 08/28/10 |
| 16 | 1602-3 | DIOXANE | 100 | MEOH | 03/20/10 |
| 17 | 1644-1 | 1248 PCB | 10 | ACETONE | 09/10/10 |
| 18* | 1591-4 | LOW SIM PNA | 1.5 | ACETONE | 08/28/10 |
| 19 | 1574-4 | AK103 | 7500 | MECL2 | 12/02/09 |
| 20 | 1572-2 | PNA | 100 | ACETONE | 12/26/09 |
| 21 | 1593-3 | SKY/BHT | 100 | MEOH | 03/31/10 |
| 22 | 1631-1 | HERB | 12.5/12500 | MEOH | 02/19/10 |
| 23* | 1505-1 | LW ABN BASE | 20 | MEOH | 03/20/10 |
| 24 | 1613-2 | LOW ABN | 10 | ACETONE | 02/28/10 |
| 25# | 1481-1 | DIPHENYL | 100 | MEOH | NA |
| 26* | 1545-2 | OP-PEST | 25 | MEOH | 02/16/10 |
| 27 | 1668-3 | STEROLS | 200 | MEOH | 10/30/10 |
| 28# | 1595-1 | ADD. PEST | 4 | ACETONE | NA |
| 29# | 1496-3 | DECANES | 100 | MEOH | NA |
| 30 | 1620-1 | EDB/DBCP | 0.2 | MEOH | 06/22/10 |
| 31 | 1596-1 | TERPINEOL | 100 | MEOH | 04/03/10 |

LCS SOLUTIONS

11/06/2009

| | | | | | |
|----|-----------------------------|-------------|--------|---------|----------|
| 32 | 1619-3 | GUAIACOL | 50-200 | ACETONE | 04/30/10 |
| 33 | 1639-3 | RETENE | 100 | MEOH | 09/03/10 |
| 34 | 1633-1 | CONGENERS | 2.5 | ACETONE | 08/11/10 |
| 35 | 1601-2 | ALKYL PNA A | 10 | MEOH | 04/03/10 |
| 36 | 1601-3 | ALKYL PNA B | 10 | MEOH | 05/13/10 |
| 50 | 1617-1 | FULL RESIN | 250 | ACETONE | 06/17/10 |
| 51 | 1611-3 | DDTS | 2.5 | ACETONE | 06/04/10 |
| 52 | 1613-5 | 1232 PCB | 20 | ACETONE | 06/16/10 |
| | | | | | |
| | *=REVERIFIED SOLUTION | | | | |
| | #=PROJECT SPECIFIC SOLUTION | | | | |
| | | | | | |
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| | | | | | |
| | | | | | |

SURR SOLUTIONS

11/06/2009

| LABEL | SOLN ID | TEST | CONC. UG/ML | SOLVENT | EXP. |
|----------------------|---------|------------|-------------|---------|----------|
| A | 1662-3 | ABN | 100/150 | MEOH | 10/08/10 |
| B | 1633-3 | SIM PNA | 15/75 | MEOH | 08/12/10 |
| C* | 1559-1 | SIM ABN | 25/37.5 | MEOH | 03/13/10 |
| D | 1635-2 | LOW PCB | 0.2 | ACETONE | 05/29/10 |
| E | 1661-2 | HERB | 62.5 | MEOH | 10/02/10 |
| F | 1574-3 | PCP | 12.5 | ACETONE | 01/06/10 |
| G* | 1534-1 | 1,4DIOXANE | 100 | MEOH | 02/20/10 |
| H | 1594-1 | OP-PEST | 25 | MEOH | 04/01/10 |
| I | 1634-1 | LOW S. PNA | 1.5 | MEOH | 08/12/10 |
| J | 1566-5 | TBT-PORE | 0.125 | MECL2 | 12/04/09 |
| K | 1612-1 | MED PCB | 20 | ACETONE | 05/29/10 |
| L | 1584-4 | TBT | 2.5 | MECL2 | 12/04/09 |
| M | 1578-1 | EPH | 1500 | MECL2 | 12/09/09 |
| N | 1612-2 | PCB | 2 | ACETONE | 05/29/10 |
| O | 1647-2 | TPH | 450 | MECL2 | 07/02/10 |
| P | 1666-3 | HCID | 2250 | MECL2 | 05/06/10 |
| Q | 1620-2 | EDB | 1 | MEOH | 06/22/10 |
| R | 1615-1 | RESIN ACID | 250 | ACETONE | 06/17/10 |
| S | 1568-5 | PBDE | .25 | MEOH | 12/11/09 |
| T | 1601-1 | ALKYL PNA | 10 | MEOH | 11/26/09 |
| U | 1633-1 | CONGENER | 2.5 | ACETONE | 08/11/10 |
| V | | | | | |
| *reverified solution | | | | | |
| X | | | | | |
| Y | | | | | |
| Z | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |



Spike Recovery Control Limits Analysis of PCB / Aroclors in Aqueous Samples - EPA SW-846 Methods 8081 & 8082 ^(1,2)

Effective 5/1/09

Control limits are updated periodically. Assure that you have ARI's current control limits by downloading the files at the time of use. <http://www.arilabs.com/portal/downloads/ARI-CLs.zip>

| Analytical Method: | Standard Analysis | MTCA Analysis | Low Level Analysis | Manchester Extraction |
|---|-------------------|-----------------|--------------------|-------------------------|
| Sample Weight / Final Volume: | 500 / 5 mL | 500 / 1 mL | 1000 / 0.5 mL | 3000 / 1 mL |
| LCS Spike Recovery ⁽⁴⁾ | | | | |
| Aroclor 1016 | 45 - 121 | 36 - 100 | 44 - 117 | 30 - 160 ⁽³⁾ |
| Aroclor 1260 | 54 - 129 | 41 - 113 | 46 - 131 | 30 - 160 ⁽³⁾ |
| | | | | |
| Method Blank/LCS Surrogate Recovery | | | | |
| Tetrachloro- <i>meta</i> -xylene (TCMX) | 40 - 118 | 29 - 100 | 31 - 100 | 30 - 160 ⁽³⁾ |
| Decachlorobiphenyl | 41 - 111 | 35 - 116 | 32 - 108 | 30 - 160 ⁽³⁾ |
| | | | | |
| Sample Surrogate Recovery | | | | |
| Tetrachloro- <i>meta</i> -xylene (TCMX) | 38 - 118 | 25 - 100 | 21 - 100 | 30 - 160 ⁽³⁾ |
| Decachlorobiphenyl | 29 - 118 | 10 - 128 | 19 - 111 | 30 - 160 ⁽³⁾ |

(1) Control Limits calculated using all data generated 1/1/08 through 12/1/08.

(2) Highlighted control limits (**bold font**) adjusted to demonstrate that ARI does not use control limits < 10 for the lower limit or < 100 for the upper limit.

(3) 30 – 160 are default, advisory control limits used when there is insufficient data to calculate historic control limits. **DO NOT** use these limits as the sole reason to reject the data from a batch of analyses.

(4) Laboratory Control Sample (LCS) spike recovery control limits also used as advisory control limits for sample matrix spike (MS) analyzes. MS recovery values are advisory and not used to assess the acceptability of an analytical batch.



Summary of Laboratory Control Limits Metals Analyses (All Methods & Sample Matrices)

Effective 5/1/09

Control limits are updated periodically. Assure that you have ARI's current control limits by downloading the files at the time of use. <http://www.arilabs.com/portal/downloads/ARI-CLs.zip>

| Element | Matrix Spike Recovery | LCS Recovery | Replicate RPD |
|-----------|-----------------------|--------------|---------------|
| Aluminum | 75 - 125 | 80 - 120 | ≤ 20% |
| Antimony | 75 - 125 | 80 - 120 | ≤ 20% |
| Arsenic | 75 - 125 | 80 - 120 | ≤ 20% |
| Barium | 75 - 125 | 80 - 120 | ≤ 20% |
| Beryllium | 75 - 125 | 80 - 120 | ≤ 20% |
| Boron | 75 - 125 | 80 - 120 | ≤ 20% |
| Cadmium | 75 - 125 | 80 - 120 | ≤ 20% |
| Calcium | 75 - 125 | 80 - 120 | ≤ 20% |
| Chromium | 75 - 125 | 80 - 120 | ≤ 20% |
| Cobalt | 75 - 125 | 80 - 120 | ≤ 20% |
| Copper | 75 - 125 | 80 - 120 | ≤ 20% |
| Iron | 75 - 125 | 80 - 120 | ≤ 20% |
| Lead | 75 - 125 | 80 - 120 | ≤ 20% |
| Magnesium | 75 - 125 | 80 - 120 | ≤ 20% |
| Manganese | 75 - 125 | 80 - 120 | ≤ 20% |
| Mercury | 75 - 125 | 80 - 120 | ≤ 20% |
| Nickel | 75 - 125 | 80 - 120 | ≤ 20% |
| Potassium | 75 - 125 | 80 - 120 | ≤ 20% |
| Selenium | 75 - 125 | 80 - 120 | ≤ 20% |
| Silica | 75 - 125 | 80 - 120 | ≤ 20% |
| Silver | 75 - 125 | 80 - 120 | ≤ 20% |
| Sodium | 75 - 125 | 80 - 120 | ≤ 20% |
| Strontium | 75 - 125 | 80 - 120 | ≤ 20% |
| Thallium | 75 - 125 | 80 - 120 | ≤ 20% |
| Vanadium | 75 - 125 | 80 - 120 | ≤ 20% |
| Zinc | 75 - 125 | 80 - 120 | ≤ 20% |

Data Summary Package

prepared
for

The Boeing Company

Project: BP2SC

ARI JOB NO: QC17, QC18

prepared
by

Analytical Resources, Inc.

PCB ANALYSIS

ORGANICS ANALYSIS DATA SHEET

PCB by GC/ECD Method SW8082

Page 1 of 1

Sample ID: PL2SC-EB2-121809

SAMPLE

Lab Sample ID: QC17A

LIMS ID: 09-31206

Matrix: Water

Data Release Authorized: *[Signature]*

Reported: 12/30/09

QC Report No: QC17-The Boeing Company

Project: BP2SC

Date Sampled: 12/18/09

Date Received: 12/18/09

Date Extracted: 12/22/09

Date Analyzed: 12/24/09 00:24

Instrument/Analyst: ECD7/JGR

GPC Cleanup: No

Sulfur Cleanup: No

Sample Amount: 500 mL

Final Extract Volume: 5.0 mL

Dilution Factor: 1.00

Silica Gel: No

Acid Cleanup: No

| CAS Number | Analyte | RL | Result |
|------------|--------------|-----|---------|
| 12674-11-2 | Aroclor 1016 | 1.0 | < 1.0 U |
| 53469-21-9 | Aroclor 1242 | 1.0 | < 1.0 U |
| 12672-29-6 | Aroclor 1248 | 1.0 | < 1.0 U |
| 11097-69-1 | Aroclor 1254 | 1.0 | < 1.0 U |
| 11096-82-5 | Aroclor 1260 | 1.0 | < 1.0 U |
| 11104-28-2 | Aroclor 1221 | 1.0 | < 1.0 U |
| 11141-16-5 | Aroclor 1232 | 1.0 | < 1.0 U |

Reported in $\mu\text{g/L}$ (ppb)

PCB Surrogate Recovery

| | |
|-----------------------|-------|
| Decachlorobiphenyl | 52.0% |
| Tetrachlorometaxylene | 65.8% |

SW8082/PCB WATER SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: QC17-The Boeing Company
Project: BP2SC

| Client ID | DCBP % REC | DCBP LCL-UCL | TCMX % REC | TCMX LCL-UCL | TOT | OUT |
|------------------|---------------|-----------------|---------------|-----------------|-----|-----|
| MB-122209 | 61.0% | 41-111 | 62.0% | 40-118 | | 0 |
| LCS-122209 | 70.2% | 41-111 | 68.0% | 40-118 | | 0 |
| LCSD-122209 | 67.8% | 41-111 | 68.0% | 40-118 | | 0 |
| PL2SC-EB2-121809 | 52.0% | 29-118 | 65.8% | 38-118 | | 0 |

Prep Method: SW3510C
Log Number Range: 09-31206 to 09-31206

ORGANICS ANALYSIS DATA SHEET

PCB by GC/ECD Method SW8082

Page 1 of 1


Sample ID: LCS-122209

LCS/LCSD

Lab Sample ID: LCS-122209

LIMS ID: 09-31206

Matrix: Water

Data Release Authorized: 

Reported: 12/30/09

QC Report No: QC17-The Boeing Company

Project: BP2SC

Date Sampled: NA

Date Received: NA

Date Extracted LCS/LCSD: 12/22/09

Sample Amount LCS: 500 mL

LCSD: 500 mL

Date Analyzed LCS: 12/23/09 23:36

Final Extract Volume LCS: 5.0 mL

LCSD: 12/24/09 00:00

LCSD: 5.0 mL

Instrument/Analyst LCS: ECD7/JGR

Dilution Factor LCS: 1.00

LCSD: ECD7/JGR

LCSD: 1.00

GPC Cleanup: No

Silica Gel: No

Sulfur Cleanup: No

Acid Cleanup: No

| Analyte | LCS | | | LCSD | | | RPD |
|--------------|------|-----------------|--------------|------|------------------|---------------|------|
| | LCS | Spike Added-LCS | LCS Recovery | LCSD | Spike Added-LCSD | LCSD Recovery | |
| Aroclor 1016 | 4.81 | 5.00 | 96.2% | 4.89 | 5.00 | 97.8% | 1.6% |
| Aroclor 1260 | 4.04 | 5.00 | 80.8% | 4.02 | 5.00 | 80.4% | 0.5% |

PCB Surrogate Recovery

| | LCS | LCSD |
|-----------------------|-------|-------|
| Decachlorobiphenyl | 70.2% | 67.8% |
| Tetrachlorometaxylene | 68.0% | 68.0% |

Results reported in $\mu\text{g/L}$

RPD calculated using sample concentrations per SW846.

4
PCB METHOD BLANK SUMMARY

BLANK NO.

QC17MBW1

Lab Name: ANALYTICAL RESOURCES, INC

Client: THE BOEING COMPANY

ARI Job No.: QC17

Project: BP2SC

Lab Sample ID: QC17MBW1

Lab File ID: 1223A020

Date Extracted: 12/22/09

Matrix: LIQUID

Date Analyzed: 12/23/09

Instrument ID: ECD7

Time Analyzed: 2313

GC Columns: ZB5/ZB35

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

| | CLIENT SAMPLE NO. ===== | LAB SAMPLE ID ===== | DATE ANALYZED ===== |
|----|-------------------------------|---------------------------|---------------------------|
| 01 | QC17LCSW1 | QC17LCSW1 | 12/23/09 |
| 02 | QC17LCSDW1 | QC17LCSDW1 | 12/24/09 |
| 03 | PL2SC-EB2-121809 | QC17A | 12/24/09 |

ALL RUNS ARE DUAL COLUMN

ORGANICS ANALYSIS DATA SHEET

PCB by GC/ECD Method SW8082

Page 1 of 1

ANALYTICAL
RESOURCES
INCORPORATED 


Sample ID: MB-122209

METHOD BLANK

Lab Sample ID: MB-122209

LIMS ID: 09-31206

Matrix: Water

Data Release Authorized: 

Reported: 12/30/09

QC Report No: QC17-The Boeing Company

Project: BP2SC

Date Sampled: NA

Date Received: NA

Date Extracted: 12/22/09

Date Analyzed: 12/23/09 23:13

Instrument/Analyst: ECD7/JGR

GPC Cleanup: No

Sulfur Cleanup: No

Sample Amount: 500 mL

Final Extract Volume: 5.0 mL

Dilution Factor: 1.00

Silica Gel: No

Acid Cleanup: No

| CAS Number | Analyte | RL | Result |
|------------|--------------|------|----------|
| 12674-11-2 | Aroclor 1016 | 0.20 | < 0.20 U |
| 53469-21-9 | Aroclor 1242 | 0.20 | < 0.20 U |
| 12672-29-6 | Aroclor 1248 | 0.20 | < 0.20 U |
| 11097-69-1 | Aroclor 1254 | 0.20 | < 0.20 U |
| 11096-82-5 | Aroclor 1260 | 0.20 | < 0.20 U |
| 11104-28-2 | Aroclor 1221 | 0.20 | < 0.20 U |
| 11141-16-5 | Aroclor 1232 | 0.20 | < 0.20 U |

Reported in $\mu\text{g/L}$ (ppb)

PCB Surrogate Recovery

| | |
|-----------------------|-------|
| Decachlorobiphenyl | 61.0% |
| Tetrachlorometaxylene | 62.0% |

METALS ANALYSIS

**INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS**


Page 1 of 1

Sample ID: PL2SC-EB2-121809
SAMPLE

Lab Sample ID: QC17A

LIMS ID: 09-31206

Matrix: Water

Data Release Authorized: 

Reported: 12/31/09

QC Report No: QC17-The Boeing Company
Project: BP2SC

Date Sampled: 12/18/09
Date Received: 12/18/09

| Prep Meth | Prep Date | Analysis Method | Analysis Date | CAS Number | Analyte | RL | µg/L | Q |
|--------------|--------------|--------------------|------------------|------------|----------|-----|------|---|
| 200.8 | 12/23/09 | 200.8 | 12/30/09 | 7440-38-2 | Arsenic | 0.2 | 0.2 | U |
| 6010B | 12/23/09 | 6010B | 12/29/09 | 7440-43-9 | Cadmium | 2 | 2 | U |
| 6010B | 12/23/09 | 6010B | 12/29/09 | 7440-47-3 | Chromium | 5 | 5 | U |
| 6010B | 12/23/09 | 6010B | 12/29/09 | 7440-50-8 | Copper | 2 | 2 | U |
| 200.8 | 12/23/09 | 200.8 | 12/30/09 | 7439-92-1 | Lead | 1 | 1 | U |
| 6010B | 12/23/09 | 6010B | 12/29/09 | 7440-22-4 | Silver | 3 | 3 | U |
| 6010B | 12/23/09 | 6010B | 12/29/09 | 7440-66-6 | Zinc | 10 | 10 | U |

U-Analyte undetected at given RL
RL-Reporting Limit

INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS
Page 1 of 1

Sample ID: PL2SC-EB2-121809
DUPLICATE

Lab Sample ID: QC17A

LIMS ID: 09-31206

Matrix: Water

Data Release Authorized:

Reported: 12/31/09

QC Report No: QC17-The Boeing Company
Project: BP2SC

Date Sampled: 12/18/09

Date Received: 12/18/09

MATRIX DUPLICATE QUALITY CONTROL REPORT

| Analyte | Analysis Method | Sample | Duplicate | RPD | Control Limit | Q |
|----------|-----------------|--------|-----------|------|---------------|---|
| Arsenic | 200.8 | 0.2 U | 0.2 U | 0.0% | +/- 0.2 | L |
| Cadmium | 6010B | 2 U | 2 U | 0.0% | +/- 2 | L |
| Chromium | 6010B | 5 U | 5 U | 0.0% | +/- 5 | L |
| Copper | 6010B | 2 U | 2 U | 0.0% | +/- 2 | L |
| Lead | 200.8 | 1 U | 1 U | 0.0% | +/- 1 | L |
| Silver | 6010B | 3 U | 3 U | 0.0% | +/- 3 | L |
| Zinc | 6010B | 10 U | 10 U | 0.0% | +/- 10 | L |

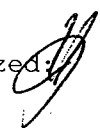
Reported in µg/L

*-Control Limit Not Met

L-RPD Invalid, Limit = Detection Limit

INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS
Page 1 of 1

Sample ID: PL2SC-EB2-121809
MATRIX SPIKE

Lab Sample ID: QC17A
LIMS ID: 09-31206
Matrix: Water
Data Release Authorized: 
Reported: 12/31/09

QC Report No: QC17-The Boeing Company
Project: BP2SC

Date Sampled: 12/18/09
Date Received: 12/18/09

MATRIX SPIKE QUALITY CONTROL REPORT

| Analyte | Analysis Method | Sample | Spike | Spike Added | % Recovery | Q |
|----------|-----------------|---------|-------|-------------|------------|---|
| Arsenic | 200.8 | 0.200 U | 25.0 | 25.0 | 100% | |
| Cadmium | 6010B | 2.00 U | 536 | 500 | 107% | |
| Chromium | 6010B | 5.00 U | 520 | 500 | 104% | |
| Copper | 6010B | 2.00 U | 460 | 500 | 92.0% | |
| Lead | 200.8 | 1.00 U | 24.8 | 25.0 | 99.2% | |
| Silver | 6010B | 3.00 U | 520 | 500 | 104% | |
| Zinc | 6010B | 10.0 U | 514 | 500 | 103% | |

Reported in µg/L

N-Control Limit Not Met

H-% Recovery Not Applicable, Sample Concentration Too High

NA-Not Applicable, Analyte Not Spiked

Percent Recovery Limits: 75-125%

INORGANICS ANALYSIS DATA SHEET

DISSOLVED METALS

Page 1 of 1

Sample ID: LAB CONTROL

Lab Sample ID: QC17LCS

LIMS ID: 09-31206

Matrix: Water

Data Release Authorized:

Reported: 12/31/09

QC Report No: QC17-The Boeing Company

Project: BP2SC

Date Sampled: NA

Date Received: NA

BLANK SPIKE QUALITY CONTROL REPORT

| Analyte | Analysis Method | Spike Found | Spike Added | % Recovery | Q |
|----------|-----------------|-------------|-------------|------------|---|
| Arsenic | 200.8 | 25.5 | 25.0 | 102% | |
| Cadmium | 6010B | 530 | 500 | 106% | |
| Chromium | 6010B | 517 | 500 | 103% | |
| Copper | 6010B | 458 | 500 | 91.6% | |
| Lead | 200.8 | 26 | 25 | 104% | |
| Silver | 6010B | 516 | 500 | 103% | |
| Zinc | 6010B | 500 | 500 | 100% | |

Reported in µg/L

N-Control limit not met

Control Limits: 80-120%

INORGANICS ANALYSIS DATA SHEET

DISSOLVED METALS

Page 1 of 1

Sample ID: METHOD BLANK

Lab Sample ID: QC17MB

LIMS ID: 09-31206

Matrix: Water

Data Release Authorized:

Reported: 12/31/09

QC Report No: QC17-The Boeing Company

Project: BP2SC

Date Sampled: NA

Date Received: NA

| Prep Meth | Prep Date | Analysis Method | Analysis Date | CAS Number | Analyte | RL | µg/L | Q |
|--------------|--------------|--------------------|------------------|------------|----------|-----|------|---|
| 200.8 | 12/23/09 | 200.8 | 12/30/09 | 7440-38-2 | Arsenic | 0.2 | 0.2 | U |
| 6010B | 12/23/09 | 6010B | 12/29/09 | 7440-43-9 | Cadmium | 2 | 2 | U |
| 6010B | 12/23/09 | 6010B | 12/29/09 | 7440-47-3 | Chromium | 5 | 5 | U |
| 6010B | 12/23/09 | 6010B | 12/29/09 | 7440-50-8 | Copper | 2 | 2 | U |
| 200.8 | 12/23/09 | 200.8 | 12/30/09 | 7439-92-1 | Lead | 1 | 1 | U |
| 6010B | 12/23/09 | 6010B | 12/29/09 | 7440-22-4 | Silver | 3 | 3 | U |
| 6010B | 12/23/09 | 6010B | 12/29/09 | 7440-66-6 | Zinc | 10 | 10 | U |

U-Analyte undetected at given RL

RL-Reporting Limit

MERCURY ANALYSIS

INORGANICS ANALYSIS DATA SHEET
Dissolved Mercury by Method SW7470A



Data Release Authorized: *[Signature]*

QC Report No: QC18-The Boeing Company

Reported: 12/23/09

Project: BP2SC

Date Received: 12/18/09

Page 1 of 1

| Client/ ARI ID | Date Sampled | Matrix | Prep Date Anal Date | RL | Result |
|-------------------|-----------------|--------|------------------------|------|--------|
| PL2SC-EB2-121809 | 12/18/09 | Water | 12/22/09 | 20.0 | 20.0 U |
| QC18A 09-31207 | | | 12/22/09 | | |
| MB-122209 | NA | Water | 12/22/09 | 20.0 | 20.0 U |
| Method Blank | | | 12/22/09 | | |


Reported in ng/L

RL-Analytical reporting limit

U-Undetected at reported detection limit

INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS
Page 1 of 1

Sample ID: PL2SC-EB2-121809
MATRIX SPIKE

Lab Sample ID: QC18A
LIMS ID: 09-31207
Matrix: Water
Data Release Authorized: 
Reported: 12/23/09

QC Report No: QC18-The Boeing Company
Project: BP2SC

Date Sampled: 12/18/09
Date Received: 12/18/09

MATRIX SPIKE QUALITY CONTROL REPORT

| Analyte | Analysis Method | Sample | Spike | Spike Added | % Recovery | Q |
|---------|-----------------|--------|-------|-------------|------------|---|
| Mercury | 7470A | 20.0 U | 93.1 | 100 | 93.1% | |

Reported in ng/L

N-Control Limit Not Met

H-% Recovery Not Applicable, Sample Concentration Too High

NA-Not Applicable, Analyte Not Spiked

Percent Recovery Limits: 75-125%

INORGANICS ANALYSIS DATA SHEET

DISSOLVED METALS

Page 1 of 1


Sample ID: PL2SC-EB2-121809

DUPLICATE

Lab Sample ID: QC18A

LIMS ID: 09-31207

Matrix: Water

Data Release Authorized: 

Reported: 12/23/09

QC Report No: QC18-The Boeing Company

Project: BP2SC

Date Sampled: 12/18/09

Date Received: 12/18/09

MATRIX DUPLICATE QUALITY CONTROL REPORT

| Analyte | Analysis Method | Sample | Duplicate | RPD | Control Limit | Q |
|---------|-----------------|--------|-----------|------|---------------|---|
| Mercury | 7470A | 20.0 U | 20.0 U | 0.0% | +/- 20.0 | L |

Reported in ng/L

*-Control Limit Not Met

L-RPD Invalid, Limit = Detection Limit

INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS
Page 1 of 1

Sample ID: LAB CONTROL

Lab Sample ID: QC18LCS
LIMS ID: 09-31207
Matrix: Water
Data Release Authorized
Reported: 12/23/09

QC Report No: QC18-The Boeing Company
Project: BP2SC
Date Sampled: NA
Date Received: NA



BLANK SPIKE QUALITY CONTROL REPORT

| Analyte | Analysis Method | Spike Found | Spike Added | % Recovery | Q |
|---------|-----------------|-------------|-------------|------------|---|
| Mercury | 7470A | 181 | 200 | 90.5% | |

Reported in ng/L

N-Control limit not met
Control Limits: 80-120%



Analytical Resources, Incorporated
Analytical Chemists and Consultants

January 19, 2010

Will Ernst
The Boeing Company
Energy and Environmental Affairs
P.O. Box 3707, M/S 7A-WH
Seattle, WA 98124-2207

RE: Boeing Plant 2 Source Control
ARI ID: QE75

Dear Will:

Please find enclosed the original *Chain of Custody* (COC) record and final data package for the project referenced above.

Sample receipt information and analytical details are addressed in the *Case Narrative*.

Copies of the reports and all associated raw data will be kept on file at ARI. If you have any questions or require additional information, please contact me at your convenience.

Sincerely,
ANALYTICAL RESOURCES, INC.

Kelly Bottem
Client Services Manager
(206) 695-6211
kellyb@arilabs.com

KB/kb

Enclosures

cc: Kent Angelos, Golder Associates Inc., 18300 NE Union Hill Road, Suite 200, Redmond,
WA 98052-3333

Chain of Custody
Documentation

prepared
for

The Boeing Company
Project: BP2 Source Control

ARI JOB NO: QE75

prepared
by

Analytical Resources, Inc.

Analytical Resources, Incorporated
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)

| | |
|-------------------|-------------------|
| Page: 1 | of 1 |
| Date: | Ice Present? N |
| No. of Coolers: 0 | Cooler Temps: AMB |

| | |
|--|---|
| ARI Assigned Number: Q475 | Turn-around Requested: 57d |
| ARI Client Company: Boeing | Phone: |
| Client Contact: Will Ernst | |
| Client Project Name: BPZ Source Control | |
| Client Project #: | Samplers: J411 Lambert St. Liz Shear |

| Sample ID | Date | Time | Matrix | No. Containers | PCB | SMS Metals | | | | | | | | | | | | | | |
|--------------------------------|--|------|-----------|----------------|--|------------|--|--|---------------------------------|--|--|--|-----------------------------|--|--|--|--|--|--|--|
| | | | | | | | | | | | | | | | | | | | | |
| PL25C-SS-J249-0107A | | | | | | | | | | | | | | | | | | | | |
| PL25C-SS-J24 | | | | | | | | | | | | | | | | | | | | |
| PL25C-SS-J249-0108A | 1/8/10 | 1012 | Fiber bag | 1 | X | X | | | | | | | | | | | | | | |
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| | | | | | | | | | | | | | | | | | | | | |
| Comments/Special Instructions | Relinquished by: (Signature) <i>[Signature]</i> | | | | Received by: (Signature) <i>[Signature]</i> | | | | Relinquished by: (Signature) | | | | Received by: (Signature) | | | | | | | |
| | Printed Name: <i>Liz Shea</i> | | | | Printed Name: <i>A. Volgardsen</i> | | | | Printed Name: | | | | Printed Name: | | | | | | | |
| | Company: <i>Goldier</i> | | | | Company: <i>ARI</i> | | | | Company: | | | | Company: | | | | | | | |
| | Date & Time: <i>1/8/2010 1207</i> | | | | Date & Time: <i>1/8/10 1207</i> | | | | Date & Time: | | | | Date & Time: | | | | | | | |

Limits of Liability: ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.



Cooler Receipt Form

ARI Client: Boeing

COC No(s): _____ (NA)

Assigned ARI Job No: Q E75

Project Name: BPA Source Control

Delivered by: Fed-Ex UPS Courier Hand Delivered Other: _____

Tracking No: _____ (NA)

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to cooler? YES (NO)

Were custody papers included with the cooler? YES NO

Were custody papers properly filled out (ink, signed, etc.) YES NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry)..... AMB

If cooler temperature is out of compliance fill out form 00070F Temp Gun ID#: _____

Cooler Accepted by: AV Date: 1/9/10 Time: 1207

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler? YES (NO)

What kind of packing material was used? ... Bubble Wrap Wet Ice Gel Packs Baggies Foam Block Paper Other: _____

Was sufficient ice used (if appropriate)? NA YES NO

Were all bottles sealed in individual plastic bags? YES NO

Did all bottles arrive in good condition (unbroken)? YES NO

Were all bottle labels complete and legible? YES NO

Did the number of containers listed on COC match with the number of containers received? YES NO

Did all bottle labels and tags agree with custody papers? YES NO

Were all bottles used correct for the requested analyses? YES NO

Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)... NA YES NO

Were all VOC vials free of air bubbles? NA YES NO

Was sufficient amount of sample sent in each bottle? YES NO

Date VOC Trip Blank was made at ARI..... NA

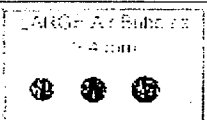
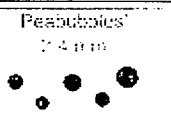
Samples Logged by: WCH Date: 1/8/10 Time: 1520

**** Notify Project Manager of discrepancies or concerns ****

| Sample ID on Bottle | Sample ID on COC | Sample ID on Bottle | Sample ID on COC |
|---------------------|------------------|---------------------|------------------|
| | | | |
| | | | |
| | | | |
| | | | |

Additional Notes, Discrepancies, & Resolutions:

By: _____ Date: _____



Small → "sm"
Peabubbles → "pb"
Large → "lg"
Headspace → "hs"



Case Narrative

Project: Boeing Plant 2 Source Control

ARI ID: QE75

Matrix: Filter Bag / Soil

Date: January 19, 2010

Sample Receipt Information

One solid matrix sample was received in good condition at ARI on 01/08/10 under ARI sample delivery group QE75. One cooler arrived at an ambient temperature.

Select samples were analyzed for the parameters listed below, as requested on the COC.

PCBs by Method 8082:

The sample was extracted on 1/13/10 and analyzed on 1/15/10 within the method recommended holding times.

Initial calibration (s): All analytes of interest were within method acceptance criteria.

Continuing calibration (s): Are in control.

Samples: There were no anomalies associated with these samples.

Surrogates: All surrogate recoveries were in control.

LCS(s): All percent recoveries for the analytes of interest were within compliance.

Method Blank: The method blank was free of contamination.

Total Metals by Methods 6010B and 7000 series

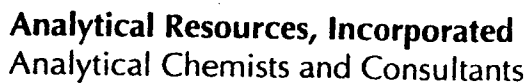
The samples were digested on 1/12/10. The digests were analyzed between 1/13/10 and 1/15/10 within the method recommended holding times.

Samples: No anomalies were encountered for these samples.

LCS/Blank Spike(s): All percent recoveries were within compliance.

Method Blank(s): Are in control.

Standard Reference: All percent recoveries were within compliance.



Organic Extractions Laboratory

Analyst Notes

ARI Job No.: QE75

Client ID: The Boeing Company

Parameter: P < B

Client Project: BPA Source Control

SOP Number(s):

No Anomalies:

List problems, concerns, corrective actions and any other pertinent information

Prep time before drying - 25 minutes Prep time after drying - 25 minutes

Sample wet weight - 713.62g

Metals Split (wet) - 5-86g Wt 11/11/14

Dry weight with plastic Ring - 204.34g

Plastic Ring Weight (Removed) - 8.48g

Dry Weight without Plastic Ring - 195.86g wc 11/13/14

Added 5X Normal Surrogate level to sample to leave room for possible dilutions. ~~5x~~ 1/13/16

sample B = would not concentrate below ~ 30-35ml on KD water Bath. NO exchange.
along desk will bring volume to ^{whenever} 50ml. Take ~~5.50~~ ^{5.50} exchange to Hexane, concentrate to 5ml for
and 1/14/10 ~~1.50~~ (exchange to Hex) and processed
th clean-ups. FEV = 50ml (1ml volume to Lab). 1/14/09 TH

Sample B - High Volume acid cleaned, transferred to new 20mL vial and re-acid cleaned - new 1/14/10

Sample B - Color remains after acid clean, emulsion present after water wash from sulfur clean,
mL taken from top solvent layer for SPE - mm 1/14/10

Analyst Initials:

Date:

Case Narrative

prepared
for

The Boeing Company

Project: BP2 Source Control

ARI JOB NO: QE75

prepared
by

Analytical Resources, Inc.



Data Reporting Qualifiers

Effective 7/10/2009

Inorganic Data

- U Indicates that the target analyte was not detected at the reported concentration
- * Duplicate RPD is not within established control limits
- B Reported value is less than the CRDL but \geq the Reporting Limit
- N Matrix Spike recovery not within established control limits
- NA Not Applicable, analyte not spiked
- H The natural concentration of the spiked element is so much greater than the concentration spiked that an accurate determination of spike recovery is not possible
- L Analyte concentration is ≤ 5 times the Reporting Limit and the replicate control limit defaults to ± 1 RL instead of the normal 20% RPD

Organic Data

- U Indicates that the target analyte was not detected at the reported concentration
- * Flagged value is not within established control limits
- B Analyte detected in an associated Method Blank at a concentration greater than one-half of ARI's Reporting Limit or 5% of the regulatory limit or 5% of the analyte concentration in the sample.
- J Estimated concentration when the value is less than ARI's established reporting limits
- D The spiked compound was not detected due to sample extract dilution
- E Estimated concentration calculated for an analyte response above the valid instrument calibration range. A dilution is required to obtain an accurate quantification of the analyte.
- Q Indicates a detected analyte with an initial or continuing calibration that does not meet established acceptance criteria ($<20\%$ RSD, $<20\%$ Drift or minimum RRF).
- S Indicates an analyte response that has saturated the detector. The calculated concentration is not valid; a dilution is required to obtain valid quantification of the analyte



Data Reporting Qualifiers

Effective 7/10/2009

- NA The flagged analyte was not analyzed for
- NR Spiked compound recovery is not reported due to chromatographic interference
- NS The flagged analyte was not spiked into the sample
- M Estimated value for an analyte detected and confirmed by an analyst but with low spectral match parameters. This flag is used only for GC-MS analyses
- M2 The sample contains PCB congeners that do not match any standard Aroclor pattern. The PCBs are identified and quantified as the Aroclor whose pattern most closely matches that of the sample. The reported value is an estimate.
- N The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification"
- Y The analyte is not detected at or above the reported concentration. The reporting limit is raised due to chromatographic interference. The Y flag is equivalent to the U flag with a raised reporting limit.
- C The analyte was positively identified on only one of two chromatographic columns. Chromatographic interference prevented a positive identification on the second column
- P The analyte was detected on both chromatographic columns but the quantified values differ by $\geq 40\%$ RPD with no obvious chromatographic interference

Geotechnical Data

- A The total of all fines fractions. This flag is used to report total fines when only sieve analysis is requested and balances total grain size with sample weight.
- F Samples were frozen prior to particle size determination
- SM Sample matrix was not appropriate for the requested analysis. This normally refers to samples contaminated with an organic product that interferes with the sieving process and/or moisture content, porosity and saturation calculations
- SS Sample did not contain the proportion of "fines" required to perform the pipette portion of the grain size analysis
- W Weight of sample in some pipette aliquots was below the level required for accurate weighting

SURR SOLUTIONS

1/5/2010

| LABEL | SOLN ID | TEST | CONC. UG/ML | SOLVENT | EXP. |
|----------------------|---------|------------|-------------|---------|----------|
| A | 1662-3 | ABN | 100/150 | MEOH | 10/08/10 |
| B | 1633-3 | SIM PNA | 15/75 | MEOH | 08/12/10 |
| C* | 1559-1 | SIM ABN | 25/37.5 | MEOH | 03/13/10 |
| D | 1689-2 | LOW PCB | 0.2 | ACETONE | 12/29/10 |
| E | 1661-2 | HERB | 62.5 | MEOH | 10/02/10 |
| F | 1683-3 | PCP | 12.5 | ACETONE | 12/09/10 |
| G* | 1534-1 | 1,4DIOXANE | 100 | MEOH | 02/20/10 |
| H | 1594-1 | OP-PEST | 25 | MEOH | 04/01/10 |
| I | 1634-1 | LOW S. PNA | 1.5 | MEOH | 08/12/10 |
| J | 1681-2 | TBT-PORE | 0.125 | MECL2 | 12/01/10 |
| K | 1689-1 | MED PCB | 20 | ACETONE | 12/29/10 |
| L | 1681-1 | TBT | 2.5 | MECL2 | 12/01/10 |
| M | 1682-1 | EPH | 1500 | MECL2 | 09/17/10 |
| N | 1689-3 | PCB | 2 | ACETONE | 12/29/10 |
| O | 1647-2 | TPH | 450 | MECL2 | 07/02/10 |
| P | 1666-3 | HCID | 2250 | MECL2 | 05/06/10 |
| Q | 1620-2 | EDB | 1 | MEOH | 06/22/10 |
| R | 1615-1 | RESIN ACID | 250 | ACETONE | 06/17/10 |
| S# | 1568-5 | PBDE | .25 | MEOH | NA |
| T | 1674-2 | ALKYL PNA | 10 | MEOH | 07/30/10 |
| U | 1633-1 | CONGENER | 2.5 | ACETONE | 08/11/10 |
| V | | | | | |
| *reverified solution | | | | | |
| #project specific | | | | | |
| Y | | | | | |
| Z | | | | | |
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LCS SOLUTIONS

1/5/2010

| LABL | SOLN ID | TEST | CONC. UG/ML | SOLVENT | EXP. |
|------|---------|--------------|-------------|---------|----------|
| 1 | 1686-1 | PCB 1660 | 20 | ACETONE | 09/01/10 |
| 2# | 1472-3 | BCOC PEST | 10 | ACETONE | NA |
| 3 | 1620-4 | PEST | 02/04/20 | ACETONE | 06/26/10 |
| 4 | 1667-1 | LOW PEST | 0.2/0.4/2 | ACETONE | 06/26/10 |
| 5 | 1677-1 | EPH | 1500 | MECL2 | 11/12/10 |
| 6 | 1655-3 | PCP | 12.5/125 | ACETONE | 09/24/10 |
| 7 | 1677-3 | ABN | 100 | ACETONE | 07/01/10 |
| 8 | 1681-4 | TBT | 2.5 | MECL2 | 12/01/10 |
| 9 | 1682-2 | PORE TBT | .125/.25 | MECL2 | 12/01/10 |
| 10 | 1621-4 | ABN ACID | 100/200 | MEOH | 07/14/10 |
| 11 | 1642-2 | TPHD | 15000 | ACETONE | 09/07/10 |
| 12 | 1622-2 | ABN BASE | 200 | ACETONE | 02/05/10 |
| 13 | 1613-1 | LOW PCB | 2 | ACETONE | 06/08/10 |
| 14* | 1547-1 | LOW ABN ACID | 10/20 | MEOH | 04/10/10 |
| 15* | 1591-3 | SIM PNA | 15/75 | MEOH | 08/28/10 |
| 16 | 1602-3 | DIOXANE | 100 | MEOH | 03/20/10 |
| 17 | 1644-1 | 1248 PCB | 10 | ACETONE | 09/10/10 |
| 18* | 1591-4 | LOW SIM PNA | 1.5 | ACETONE | 08/28/10 |
| 19 | 1685-3 | AK103 | 7500 | ACETONE | 09/03/10 |
| 20 | 1682-4 | PNA | 100 | ACETONE | 12/04/10 |
| 21 | 1593-3 | SKY/BHT | 100 | MEOH | 03/31/10 |
| 22 | 1675-1 | HERB | 12.5/12500 | MEOH | 02/19/10 |
| 23* | 1505-1 | LW ABN BASE | 20 | MEOH | 03/20/10 |
| 24 | 1613-2 | LOW ABN | 10 | ACETONE | 02/28/10 |
| 25# | 1481-1 | DIPHENYL | 100 | MEOH | NA |
| 26* | 1545-2 | OP-PEST | 25 | MEOH | 02/16/10 |
| 27 | 1668-3 | STEROLS | 200 | MEOH | 10/30/10 |
| 28# | 1684-1 | ADD. PEST | 4 | ACETONE | 03/25/10 |
| 29# | 1496-3 | DECANES | 100 | MEOH | NA |
| 30 | 1620-1 | EDB/DBCP | 0.2 | MEOH | 06/22/10 |
| 31 | 1596-1 | TERPINEOL | 100 | MEOH | 04/03/10 |

LCS SOLUTIONS

1/5/2010

| | | | | | |
|----|-----------------------------|-------------|--------|---------|----------|
| 32 | 1619-3 | GUAIACOL | 50-200 | ACETONE | 04/30/10 |
| 33 | 1639-3 | RETENE | 100 | MEOH | 09/03/10 |
| 34 | 1633-1 | CONGENERS | 2.5 | ACETONE | 08/11/10 |
| 35 | 1674-3 | ALKYL PNA A | 10 | MEOH | 10/28/10 |
| 36 | 1601-3 | ALKYL PNA B | 10 | MEOH | 05/13/10 |
| 50 | 1617-1 | FULL RESIN | 250 | ACETONE | 06/17/10 |
| 51 | 1611-3 | DDTS | 2.5 | ACETONE | 06/04/10 |
| 52 | 1613-5 | 1232 PCB | 20 | ACETONE | 06/16/10 |
| | | | | | |
| | *=REVERIFIED SOLUTION | | | | |
| | #=PROJECT SPECIFIC SOLUTION | | | | |
| | | | | | |
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Summary of Laboratory Control Limits

Default limits of 30-160% recovery and 30% RPD apply for all organic analytes when laboratory generated control limits are not available on ARI's web site. Default limits for all inorganic analytes are 75-125% recovery and 25% RPD.

ARI's laboratory generated Quality Control Limits may be superseded by project specific data quality objectives (DQO) provided by ARI's clients. The use of project specific DQO must be approved by ARI's Laboratory and QA Program Managers.



Summary of Laboratory Control Limits Metals Analyses (All Methods & Sample Matrices)

Effective 5/1/09

Control limits are updated periodically. Assure that you have ARI's current control limits by downloading the files at the time of use. <http://www.arilabs.com/portal/downloads/ARI-CLs.zip>

| Element | Matrix Spike Recovery | LCS Recovery | Replicate RPD |
|-----------|-----------------------|--------------|---------------|
| Aluminum | 75 - 125 | 80 - 120 | ≤ 20% |
| Antimony | 75 - 125 | 80 - 120 | ≤ 20% |
| Arsenic | 75 - 125 | 80 - 120 | ≤ 20% |
| Barium | 75 - 125 | 80 - 120 | ≤ 20% |
| Beryllium | 75 - 125 | 80 - 120 | ≤ 20% |
| Boron | 75 - 125 | 80 - 120 | ≤ 20% |
| Cadmium | 75 - 125 | 80 - 120 | ≤ 20% |
| Calcium | 75 - 125 | 80 - 120 | ≤ 20% |
| Chromium | 75 - 125 | 80 - 120 | ≤ 20% |
| Cobalt | 75 - 125 | 80 - 120 | ≤ 20% |
| Copper | 75 - 125 | 80 - 120 | ≤ 20% |
| Iron | 75 - 125 | 80 - 120 | ≤ 20% |
| Lead | 75 - 125 | 80 - 120 | ≤ 20% |
| Magnesium | 75 - 125 | 80 - 120 | ≤ 20% |
| Manganese | 75 - 125 | 80 - 120 | ≤ 20% |
| Mercury | 75 - 125 | 80 - 120 | ≤ 20% |
| Nickel | 75 - 125 | 80 - 120 | ≤ 20% |
| Potassium | 75 - 125 | 80 - 120 | ≤ 20% |
| Selenium | 75 - 125 | 80 - 120 | ≤ 20% |
| Silica | 75 - 125 | 80 - 120 | ≤ 20% |
| Silver | 75 - 125 | 80 - 120 | ≤ 20% |
| Sodium | 75 - 125 | 80 - 120 | ≤ 20% |
| Strontium | 75 - 125 | 80 - 120 | ≤ 20% |
| Thallium | 75 - 125 | 80 - 120 | ≤ 20% |
| Vanadium | 75 - 125 | 80 - 120 | ≤ 20% |
| Zinc | 75 - 125 | 80 - 120 | ≤ 20% |

Data Summary Package

prepared
for

The Boeing Company

Project: BP2 Source Control

ARI JOB NO: QE75

prepared
by

Analytical Resources, Inc.

PCB ANALYSIS

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082
Page 1 of 1

Sample ID: PL2SC-SS-J249-010810
SAMPLE

Lab Sample ID: QE75B

LIMS ID: 10-542

Matrix: Filter

Data Release Authorized: *AB*

Reported: 01/18/10

QC Report No: QE75-The Boeing Company

Project: BP2 Source Control

Date Sampled: 01/08/10

Date Received: 01/08/10

Date Extracted: 01/13/10

Date Analyzed: 01/15/10 12:56

Instrument/Analyst: ECD5/JGR

GPC Cleanup: No

Sulfur Cleanup: Yes

Acid Cleanup: Yes

Sample Amount: 1.00 Filter

Final Extract Volume: 50 mL

Dilution Factor: 100

Silica Gel: Yes

| CAS Number | Analyte | RL | Result |
|-------------------|---------------------|------------|------------|
| 12674-11-2 | Aroclor 1016 | 100 | < 100 U |
| 53469-21-9 | Aroclor 1242 | 100 | < 100 U |
| 12672-29-6 | Aroclor 1248 | 100 | < 100 U |
| 11097-69-1 | Aroclor 1254 | 180 | < 180 Y |
| 11096-82-5 | Aroclor 1260 | 100 | 400 |
| 11104-28-2 | Aroclor 1221 | 100 | < 100 U |
| 11141-16-5 | Aroclor 1232 | 100 | < 100 U |

Reported in Total μ g

PCB Surrogate Recovery

| | |
|-----------------------|---|
| Decachlorobiphenyl | D |
| Tetrachlorometaxylene | D |

SW8082/PCB SURROGATE RECOVERY SUMMARY

Matrix: Filter

QC Report No: QE75-The Boeing Company
Project: BP2 Source Control

| <u>Client ID</u> | <u>DCBP</u> | <u>TCMX</u> | <u>TOT OUT</u> |
|----------------------|-------------|-------------|----------------|
| MB-011310 | 73.0% | 82.2% | 0 |
| LCS-011310 | 72.0% | 76.8% | 0 |
| LCSD-011310 | 70.5% | 74.0% | 0 |
| PL2SC-SS-J249-010810 | D | D | 0 |

| | <u>LCS/MB LIMITS</u> | <u>QC LIMITS</u> |
|--------------------------------|----------------------|------------------|
| (DCBP) = Decachlorobiphenyl | (30-160) | (30-160) |
| (TCMX) = Tetrachlorometaxylene | (30-160) | (30-160) |

Prep Method: SW3550B
Log Number Range: 10-542 to 10-542

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082
Page 1 of 1



Sample ID: LCS-011310
LCS/LCSD

Lab Sample ID: LCS-011310
LIMS ID: 10-542
Matrix: Filter
Data Release Authorized: *B*
Reported: 01/18/10

QC Report No: QE75-The Boeing Company
Project: BP2 Source Control

Date Sampled: 01/08/10
Date Received: 01/08/10

Date Extracted LCS/LCSD: 01/13/10

Sample Amount LCS: 1.00 Filter
LCSD: 1.00 Filter

Date Analyzed LCS: 01/15/10 12:13
LCSD: 01/15/10 12:34

Final Extract Volume LCS: 5.0 mL
LCSD: 5.0 mL

Instrument/Analyst LCS: ECD5/JGR
LCSD: ECD5/JGR

Dilution Factor LCS: 1.00
LCSD: 1.00

GPC Cleanup: No
Sulfur Cleanup: Yes

Silica Gel: Yes
Acid Cleanup: Yes

| Analyte | LCS | Spike Added-LCS | LCS Recovery | LCSD | Spike Added-LCSD | LCSD Recovery | RPD |
|--------------|-----|-----------------|--------------|------|------------------|---------------|------|
| Aroclor 1016 | 2.4 | 2.5 | 96.0% | 2.4 | 2.5 | 96.0% | 0.0% |
| Aroclor 1260 | 2.0 | 2.5 | 80.0% | 2.0 | 2.5 | 80.0% | 0.0% |

PCB Surrogate Recovery

| | LCS | LCSD |
|-----------------------|-------|-------|
| Decachlorobiphenyl | 72.0% | 70.5% |
| Tetrachlorometaxylene | 76.8% | 74.0% |

Reported in Total μg
RPD calculated using sample concentrations per SW846.

4
PCB METHOD BLANK SUMMARY

BLANK NO.

QE75MB1

Lab Name: ANALYTICAL RESOURCES, INC

Client: THE BOEING COMPANY

ARI Job No.: QE75

Project: BP2 SOURCE CONTROL

Lab Sample ID: QE75MB1

Lab File ID: 0115B005

Date Extracted: 01/13/10

Matrix: SOLID

Date Analyzed: 01/15/10

Instrument ID: ECD5

Time Analyzed: 1151

GC Columns: ZB5/ZB35

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

| | CLIENT SAMPLE NO. ===== | LAB SAMPLE ID ===== | DATE ANALYZED ===== |
|----|-------------------------------|---------------------------|---------------------------|
| 01 | QE75LCS1 | QE75LCS1 | 01/15/10 |
| 02 | QE75LCSD1 | QE75LCSD1 | 01/15/10 |
| 03 | PL2SC-SS-J249-01081 | QE75B | 01/15/10 |

ALL RUNS ARE DUAL COLUMN

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082
Page 1 of 1

Sample ID: MB-011310
METHOD BLANK

Lab Sample ID: MB-011310

LIMS ID: 10-542

Matrix: Filter

Data Release Authorized: *AB*

Reported: 01/18/10

QC Report No: QE75-The Boeing Company

Project: BP2 Source Control

Date Sampled: NA

Date Received: NA

Date Extracted: 01/13/10

Date Analyzed: 01/15/10 11:51

Instrument/Analyst: ECD5/JGR

GPC Cleanup: No

Sulfur Cleanup: Yes

Acid Cleanup: Yes

Sample Amount: 1.00 Filter

Final Extract Volume: 5.0 mL

Dilution Factor: 1.00

Silica Gel: Yes

| CAS Number | Analyte | RL | Result |
|------------|--------------|-----|---------|
| 12674-11-2 | Aroclor 1016 | 0.1 | < 0.1 U |
| 53469-21-9 | Aroclor 1242 | 0.1 | < 0.1 U |
| 12672-29-6 | Aroclor 1248 | 0.1 | < 0.1 U |
| 11097-69-1 | Aroclor 1254 | 0.1 | < 0.1 U |
| 11096-82-5 | Aroclor 1260 | 0.1 | < 0.1 U |
| 11104-28-2 | Aroclor 1221 | 0.1 | < 0.1 U |
| 11141-16-5 | Aroclor 1232 | 0.1 | < 0.1 U |

Reported in Total μ g

PCB Surrogate Recovery

| | |
|-----------------------|-------|
| Decachlorobiphenyl | 73.0% |
| Tetrachlorometaxylene | 82.2% |

METALS ANALYSIS

INORGANICS ANALYSIS DATA SHEET

TOTAL METALS

Page 1 of 1

Sample ID: PL2SC-SS-J249-010810

SAMPLE

Lab Sample ID: QE75A

LIMS ID: 10-541

Matrix: Soil

Data Release Authorized

Reported: 01/18/10

QC Report No: QE75-The Boeing Company

Project: BP2 Source Control

Date Sampled: 01/08/10

Date Received: 01/08/10

Percent Total Solids: 20.3%

| Prep Meth | Prep Date | Analysis Method | Analysis Date | CAS Number | Analyte | RL | mg/kg-dry | Q |
|--------------|--------------|--------------------|------------------|------------|----------|------|-----------|---|
| 3050B | 01/12/10 | 200.8 | 01/14/10 | 7440-38-2 | Arsenic | 0.9 | 12.7 | |
| 3050B | 01/12/10 | 6010B | 01/15/10 | 7440-43-9 | Cadmium | 1 | 7 | |
| 3050B | 01/12/10 | 6010B | 01/15/10 | 7440-47-3 | Chromium | 2 | 149 | |
| 3050B | 01/12/10 | 6010B | 01/15/10 | 7440-50-8 | Copper | 1 | 839 | |
| 3050B | 01/12/10 | 200.8 | 01/14/10 | 7439-92-1 | Lead | 5 | 404 | |
| CLP | 01/12/10 | 7471A | 01/13/10 | 7439-97-6 | Mercury | 0.09 | 0.85 | |
| 3050B | 01/12/10 | 6010B | 01/15/10 | 7440-22-4 | Silver | 1 | 8 | |
| 3050B | 01/12/10 | 6010B | 01/15/10 | 7440-66-6 | Zinc | 5 | 3,620 | |

U-Analyte undetected at given RL
RL-Reporting Limit

INORGANICS ANALYSIS DATA SHEET

TOTAL METALS


Page 1 of 1

Sample ID: METHOD BLANK

Lab Sample ID: QE75MB

LIMS ID: 10-541

Matrix: Soil

Data Release Authorized: 

Reported: 01/18/10

QC Report No: QE75-The Boeing Company

Project: BP2 Source Control

Date Sampled: NA

Date Received: NA

Percent Total Solids: NA

| Prep Meth | Prep Date | Analysis Method | Analysis Date | CAS Number | Analyte | RL | mg/kg-dry | Q |
|--------------|--------------|--------------------|------------------|------------|----------|------|-----------|---|
| 3050B | 01/12/10 | 200.8 | 01/14/10 | 7440-38-2 | Arsenic | 0.2 | 0.2 | U |
| 3050B | 01/12/10 | 6010B | 01/15/10 | 7440-43-9 | Cadmium | 0.2 | 0.2 | U |
| 3050B | 01/12/10 | 6010B | 01/15/10 | 7440-47-3 | Chromium | 0.5 | 0.5 | U |
| 3050B | 01/12/10 | 6010B | 01/15/10 | 7440-50-8 | Copper | 0.2 | 0.2 | U |
| 3050B | 01/12/10 | 200.8 | 01/14/10 | 7439-92-1 | Lead | 1 | 1 | U |
| CLP | 01/12/10 | 7471A | 01/13/10 | 7439-97-6 | Mercury | 0.02 | 0.02 | U |
| 3050B | 01/12/10 | 6010B | 01/15/10 | 7440-22-4 | Silver | 0.3 | 0.3 | U |
| 3050B | 01/12/10 | 6010B | 01/15/10 | 7440-66-6 | Zinc | 1 | 1 | U |

U-Analyte undetected at given RL

RL-Reporting Limit

INORGANICS ANALYSIS DATA SHEET

TOTAL METALS

Page 1 of 1

Sample ID: LAB CONTROL

Lab Sample ID: QE75LCS

LIMS ID: 10-541

Matrix: Soil

Data Release Authorized

Reported: 01/18/10

QC Report No: QE75-The Boeing Company

Project: BP2 Source Control

Date Sampled: NA

Date Received: NA

BLANK SPIKE QUALITY CONTROL REPORT

| Analyte | Analysis Method | Spike Found | Spike Added | % Recovery | Q |
|----------|-----------------|-------------|-------------|------------|---|
| Arsenic | 200.8 | 26.9 | 25.0 | 108% | |
| Cadmium | 6010B | 52.2 | 50.0 | 104% | |
| Chromium | 6010B | 51.6 | 50.0 | 103% | |
| Copper | 6010B | 51.5 | 50.0 | 103% | |
| Lead | 200.8 | 25 | 25 | 100% | |
| Mercury | 7471A | 0.58 | 0.50 | 116% | |
| Silver | 6010B | 52.5 | 50.0 | 105% | |
| Zinc | 6010B | 49 | 50 | 98.0% | |

Reported in mg/kg-dry

N-Control limit not met

NA-Not Applicable, Analyte Not Spiked

Control Limits: 80-120%

TOTAL SOLIDS

Solids Data Entry Report
Date: 01/13/10

Checked by: MH
Data Analyst: DM

Date: 1/14/10

Solids Determination performed on 01/12/10 by DM

| JOB | SAMPLE | CLIENTID | TAREWEIGHT | SAMPDISH | DRYWEIGHT | SOLIDS |
|------|--------|---------------------|------------|----------|-----------|--------|
| QE75 | A | PL2SC-SS-J249-01081 | 0.974 | 3.035 | 1.392 | 20.28 |



Analytical Resources, Incorporated
Analytical Chemists and Consultants

Total Solids Bench Sheet

Laboratory Section Metals

Oven Identification: 07

Balance ID: 068755

Samples in Oven: Date: 1-12-10 Time: 2215 Temp: 103°C Analyst: DM

Removed from Oven: Date: 1-13-10 Time: 2130 Temp: 102°C Analyst: DM

Source of Total Solids Data If From A Different Lab: —

| ARI Sample ID | Tare Weight (g) | Tare + Sample Wet (g) | Tare + Sample Dry (g) | Date & Time Last Weight | Final Weighting >12 hrs ¹ |
|---------------|-----------------|-----------------------|-----------------------|-------------------------|--------------------------------------|
| QE75 A | 0.974 | 3.035 | 1.392 | — | ✓ |
| QF10 A | 0.966 | 10.131 | 8.198 | — | ✓ |
| " B | 0.967 | 10.572 | 8.504 | — | ✓ |
| QES6 B | 0.985 | 10.642 | 3.001 | — | ✓ |
| " C | 0.966 | 10.234 | 2.796 | — | ✓ |
| " D | 1.004 | 10.658 | 2.996 | — | ✓ |
| QE94 B | 1.016 | 10.459 | 9.619 | — | ✓ |
| QE92 A | 0.989 | 10.365 | 8.659 | — | ✓ |
| " C | 0.982 | 10.392 | 8.845 | — | ✓ |
| " E | 0.961 | 10.914 | 9.639 | — | ✓ |
| " G | 0.957 | 10.181 | 9.107 | — | ✓ |
| " I | 0.981 | 10.522 | 9.520 | — | ✓ |
| " K | 1.002 | 10.201 | 9.313 | — | ✓ |
| " P | 0.997 | 10.438 | 9.877 | — | ✓ |
| " R | 0.975 | 10.451 | 9.773 | — | ✓ |
| 1-12-10 DM | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

1) Place a check mark in this column if samples have dried > 12 but < 24 hours. When samples have been at 104°C < 12 hours, constant weight must be verified as described in SOP 10023S. Use a 2nd bench sheet for additional weightings.



Analytical Resources, Incorporated
Analytical Chemists and Consultants

January 21, 2010

Kent Angelos
Golder Associates, Inc.
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

RE: Boeing Plant 2 Source Control
ARI IDs: QF18 and QF21

Dear Kent:

Please find enclosed the original Chain of Custody (COC) records, sample receipt documentation, and the final data package for the project referenced above.

Sample receipt information and analytical details are addressed in the Case Narrative.

An electronic copy of this package will be kept on file at ARI. If you have any questions or require additional information, please contact me at your convenience.

Sincerely,
ANALYTICAL RESOURCES, INC.

Kelly Bottem
Client Services Manager
(206) 695-6211
kellyb@arilabs.com

KB/ej

cc: Kent Angelos, Golder Associates Inc., 18300 NE Union Hill Road, Suite 200,
Redmond, WA 98052-3333

Enclosures

Chain of Custody
Documentation

prepared
for

The Boeing Company

Project: Boeing Plant 2 Source Control

ARI JOB NO: QF18, QF21

prepared
by

Analytical Resources, Inc.

Analytical Resources, Incorporated
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)

| | |
|-------------------|--------------------|
| Page: 1 | of 1 |
| Date: 01/12/2010 | Ice Present? Yes |
| No. of Coolers: 1 | Cooler Temps: 10.8 |

| | | | |
|----------------------|-------------------------------|------------------------|-----|
| ARI Assigned Number: | QF48 | Turn-around Requested: | 57d |
| ARI Client Company: | Boeing | | |
| Client Contact: | Will Feust | | |
| Client Project Name: | Boeing Plant 2 Source Control | | |
| Client Project #: | Samplers: J Lamberts, L. Shea | | |

[illegible]

Limits of Liability: ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.



Cooler Receipt Form

ARI Client: Boeing

Project Name: Boeing Plant 2 Source Control

COC No(s): _____ NA

Delivered by: Fed-Ex UPS Courier Hand Delivered Other: _____

Assigned ARI Job No: QF18

Tracking No: _____ NA

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of cooler? YES NO

Were custody papers included with the cooler? YES NO

Were custody papers properly filled out (ink, signed, etc.) YES NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry)..... 10.8

If cooler temperature is out of compliance fill out form 00070F Temp Gun ID#: 90941619

Cooler Accepted by: JW Date: 11/2/10 Time: 1424

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler? YES NO

What kind of packing material was used? ... Bubble Wrap Wet Ice Gel Packs Baggies Foam Block Paper Other: _____

Was sufficient ice used (if appropriate)? NA YES NO

Were all bottles sealed in individual plastic bags? YES NO

Did all bottles arrive in good condition (unbroken)? YES NO

Were all bottle labels complete and legible? YES NO

Did the number of containers listed on COC match with the number of containers received? YES NO

Did all bottle labels and tags agree with custody papers? YES NO

Were all bottles used correct for the requested analyses? YES NO

Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)... NA YES NO

Were all VOC vials free of air bubbles? NA YES NO

Was sufficient amount of sample sent in each bottle? YES NO

Date VOC Trip Blank was made at ARI... NA

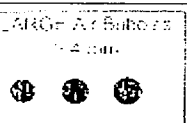
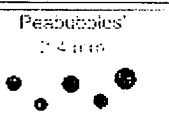
Samples Logged by: JW Date: 11/2/10 Time: 1455

**** Notify Project Manager of discrepancies or concerns ****

| Sample ID on Bottle | Sample ID on COC | Sample ID on Bottle | Sample ID on COC |
|---------------------|------------------|---------------------|------------------|
| | | | |
| | | | |
| | | | |
| | | | |

Additional Notes, Discrepancies, & Resolutions:

By: _____ Date: _____



Small → "sm"
Peabubbles → "pb"
Large → "lg"
Headspace → "hs"



ARI Job No: QF18
PC: Kelly
VTSR: 01/12/10

Inquiry Number: NONE
Analysis Requested: 01/12/10
Contact: Ernst, Will
Client: The Boeing Company
Logged by: JW
Sample Set Used: Yes-481
Validatable Package: No
Deliverables:

Project #:
Project: Boeing Plant 2 Source Control
Sample Site:
SDG No:
Analytical Protocol: In-house

| LOGNUM | CLIENT ID | CN | WAD | NH3 | COD | FOG | MET | PHEN | PHOS | TKN | NO23 | TOC | S2 | AK102 | Fe2+ | DMET DOC | FLT | FLT | PARAMETER | ADJUSTED TO | LOT NUMBER | AMOUNT ADDED | DATE/BY |
|--------|------------------|----|-----|-----|-----|-----|-----|------|------|-----|------|-----|----|-------|------|----------|-----|-----|-----------|-------------|------------|--------------|---------|
| 10-705 | | | | | | | | | | | | | | | | | | | | | | | |
| QF18A | PL2SC-EB1-011210 | | | | | | DIS | | | | | | | | | | Y | | | | | | |

Checked By JW Date 1/12/10



Cooler Receipt Form

ARI Client: Boeing

COC No(s): _____ (NA)

Assigned ARI Job No: QF21

Project Name: Plant 2 Source Control

Delivered by: Fed-Ex UPS Courier Hand Delivered Other: _____

Tracking No: _____ (NA)

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to cooler? YES (NO)

Were custody papers included with the cooler? (YES) NO

Were custody papers properly filled out (ink, signed, etc.) (YES) NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry)..... 10.8

If cooler temperature is out of compliance fill out form 00070F Temp Gun ID#: 90941619

Cooler Accepted by: JW Date: 1/12/10 Time: 1424

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler? YES (NO)

What kind of packing material was used? ... Bubble Wrap (Wet Ice) Gel Packs Baggies Foam Block Paper Other: _____

Was sufficient ice used (if appropriate)? NA YES (NO)

Were all bottles sealed in individual plastic bags? YES (NO)

Did all bottles arrive in good condition (unbroken)? (YES) NO

Were all bottle labels complete and legible? (YES) NO

Did the number of containers listed on COC match with the number of containers received? (YES) NO

Did all bottle labels and tags agree with custody papers? (YES) NO

Were all bottles used correct for the requested analyses? (YES) NO

Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)... NA YES (YES) NO

Were all VOC vials free of air bubbles? (NA) YES NO

Was sufficient amount of sample sent in each bottle? (YES) NO

Date VOC Trip Blank was made at ARI..... (NA)

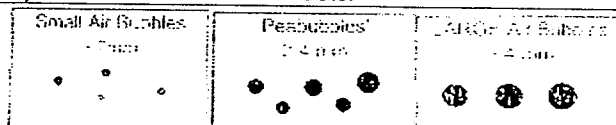
Samples Logged by: JLS Date: 1/12/10 Time: 1510

**** Notify Project Manager of discrepancies or concerns ****

| Sample ID on Bottle | Sample ID on COC | Sample ID on Bottle | Sample ID on COC |
|---------------------|------------------|---------------------|------------------|
| | | | |
| | | | |
| | | | |
| | | | |

Additional Notes, Discrepancies, & Resolutions:

By: _____ Date: _____



Small → "sm"
Peabubbles → "pb"
Large → "lg"
Headspace → "hs"



ARI Job No: QF21
PC: Kelly
VTSR: 01/12/10

Inquiry Number: NONE
Analysis Requested: 01/12/10
Contact: Ernst, Will
Client: The Boeing Company
Logged by: JW
Sample Set Used: Yes-481
Validatable Package: No
Deliverables:

Project #:
Project: Boeing Plant 2 Source Control
Sample Site:
SDG No:
Analytical Protocol: In-house

| LOGNUM | CLIENT ID | CN | WAD | NH3 | COD | FOG | MET | PHEN | PHOS | TKN | NO23 | TOC | S2 | AK102Fe2+ | DMET DOC | FLT | FLT | PARAMETER | ADJUSTED TO | LOT NUMBER | AMOUNT ADDED | DATE/BY |
|--------|------------------|----|-----|-----|-----|-----|-----|------|------|-----|------|-----|----|-----------|----------|-----|-----|-----------|-------------|------------|--------------|---------|
| 10-725 | | | | | | | DIS | | | | | | | | Y | | | | | | | |
| QF21A | FL2SC-EB1-011210 | | | | | | OK | | | | | | | | | | | | | | | |

Checked By JW Date 1/12/10

Case Narrative

prepared
for

The Boeing Company

Project: Boeing Plant 2 Source Control

ARI JOB NO: QF18, QF21

prepared
by

Analytical Resources, Inc.



Case Narrative

Project: Boeing Plant 2 Source Control

ARI IDs: QF18 and QF21

Matrix: Water

Date: January 21, 2010

Sample Receipt Information

One water sample was received in good condition at Analytical Resources, Inc. (ARI) on January 12, 2010 under ARI sample delivery groups (SDGs) QF18 and QF21. The cooler temperature, as measured by IR thermometer, was 10.8°C. For further details regarding sample receipt, please refer to the enclosed Cooler Receipt Form and Preservation Verification sheet.

The sample was analyzed for the parameters listed below, as requested on the Chain of Custody.

PCBs by Method 8082:

The sample was extracted on 1/14/10 and analyzed on 1/18/10 within the method recommended holding times.

Initial calibration (s): All analytes of interest were within method acceptance criteria.

Continuing calibration (s): Are in control.

Samples: There were no anomalies associated with this sample.

Surrogates: All surrogate recoveries were in control.

LCS(s): All percent recoveries for the analytes of interest were within compliance.

Method Blank: The method blank was free of contamination.

Dissolved Metals by Methods 6010B and 7000 series

The sample was digested on 1/13/10. The digest was analyzed on 1/18/10 within the method recommended holding times.

Samples: No anomalies were encountered for this sample.

LCS/Blank Spike(s): All percent recoveries were within compliance.

Method Blank(s): Were in control.

Dissolved Low-Level Mercury by Method SW7470A

The sample was digested on 1/13/10. The digest was analyzed on 1/14/10 within the method recommended holding times.



Case Narrative

Project: Boeing Plant 2 Source Control

ARI IDs: QF18 and QF21

Matrix: Water

Date: January 21, 2010

Samples: No anomalies were encountered for this sample.

LCS/Blank Spike(s): All percent recoveries were within compliance.

Method Blank(s): Were in control.



Data Reporting Qualifiers

Effective 7/10/2009

Inorganic Data

- U Indicates that the target analyte was not detected at the reported concentration
- * Duplicate RPD is not within established control limits
- B Reported value is less than the CRDL but \geq the Reporting Limit
- N Matrix Spike recovery not within established control limits
- NA Not Applicable, analyte not spiked
- H The natural concentration of the spiked element is so much greater than the concentration spiked that an accurate determination of spike recovery is not possible
- L Analyte concentration is ≤ 5 times the Reporting Limit and the replicate control limit defaults to ± 1 RL instead of the normal 20% RPD

Organic Data

- U Indicates that the target analyte was not detected at the reported concentration
- * Flagged value is not within established control limits
- B Analyte detected in an associated Method Blank at a concentration greater than one-half of ARI's Reporting Limit or 5% of the regulatory limit or 5% of the analyte concentration in the sample.
- J Estimated concentration when the value is less than ARI's established reporting limits
- D The spiked compound was not detected due to sample extract dilution
- E Estimated concentration calculated for an analyte response above the valid instrument calibration range. A dilution is required to obtain an accurate quantification of the analyte.
- Q Indicates a detected analyte with an initial or continuing calibration that does not meet established acceptance criteria ($<20\%$ RSD, $<20\%$ Drift or minimum RRF).
- S Indicates an analyte response that has saturated the detector. The calculated concentration is not valid; a dilution is required to obtain valid quantification of the analyte



Data Reporting Qualifiers

Effective 7/10/2009

- NA The flagged analyte was not analyzed for
- NR Spiked compound recovery is not reported due to chromatographic interference
- NS The flagged analyte was not spiked into the sample
- M Estimated value for an analyte detected and confirmed by an analyst but with low spectral match parameters. This flag is used only for GC-MS analyses
- M2 The sample contains PCB congeners that do not match any standard Aroclor pattern. The PCBs are identified and quantified as the Aroclor whose pattern most closely matches that of the sample. The reported value is an estimate.
- N The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification"
- Y The analyte is not detected at or above the reported concentration. The reporting limit is raised due to chromatographic interference. The Y flag is equivalent to the U flag with a raised reporting limit.
- C The analyte was positively identified on only one of two chromatographic columns. Chromatographic interference prevented a positive identification on the second column
- P The analyte was detected on both chromatographic columns but the quantified values differ by $\geq 40\%$ RPD with no obvious chromatographic interference

Geotechnical Data

- A The total of all fines fractions. This flag is used to report total fines when only sieve analysis is requested and balances total grain size with sample weight.
- F Samples were frozen prior to particle size determination
- SM Sample matrix was not appropriate for the requested analysis. This normally refers to samples contaminated with an organic product that interferes with the sieving process and/or moisture content, porosity and saturation calculations
- SS Sample did not contain the proportion of "fines" required to perform the pipette portion of the grain size analysis
- W Weight of sample in some pipette aliquots was below the level required for accurate weighting

SURR SOLUTIONS

1/5/2010

| LABEL | SOLN ID | TEST | CONC. UG/ML | SOLVENT | EXP. |
|----------------------|---------|------------|-------------|---------|----------|
| A | 1662-3 | ABN | 100/150 | MEOH | 10/08/10 |
| B | 1633-3 | SIM PNA | 15/75 | MEOH | 08/12/10 |
| C* | 1559-1 | SIM ABN | 25/37.5 | MEOH | 03/13/10 |
| D | 1689-2 | LOW PCB | 0.2 | ACETONE | 12/29/10 |
| E | 1661-2 | HERB | 62.5 | MEOH | 10/02/10 |
| F | 1683-3 | PCP | 12.5 | ACETONE | 12/09/10 |
| G* | 1534-1 | 1,4DIOXANE | 100 | MEOH | 02/20/10 |
| H | 1594-1 | OP-PEST | 25 | MEOH | 04/01/10 |
| I | 1634-1 | LOW S. PNA | 1.5 | MEOH | 08/12/10 |
| J | 1681-2 | TBT-PORE | 0.125 | MECL2 | 12/01/10 |
| K | 1689-1 | MED PCB | 20 | ACETONE | 12/29/10 |
| L | 1681-1 | TBT | 2.5 | MECL2 | 12/01/10 |
| M | 1682-1 | EPH | 1500 | MECL2 | 09/17/10 |
| N | 1689-3 | PCB | 2 | ACETONE | 12/29/10 |
| O | 1647-2 | TPH | 450 | MECL2 | 07/02/10 |
| P | 1666-3 | HCID | 2250 | MECL2 | 05/06/10 |
| Q | 1620-2 | EDB | 1 | MEOH | 06/22/10 |
| R | 1615-1 | RESIN ACID | 250 | ACETONE | 06/17/10 |
| S# | 1568-5 | PBDE | .25 | MEOH | NA |
| T | 1674-2 | ALKYL PNA | 10 | MEOH | 07/30/10 |
| U | 1633-1 | CONGENER | 2.5 | ACETONE | 08/11/10 |
| V | | | | | |
| *reverified solution | | | | | |
| #project specific | | | | | |
| Y | | | | | |
| Z | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

LCS SOLUTIONS

1/5/2010

| LABL | SOLN ID | TEST | CONC. UG/ML | SOLVENT | EXP. |
|------|---------|--------------|-------------|---------|----------|
| 1 | 1686-1 | PCB 1660 | 20 | ACETONE | 09/01/10 |
| 2# | 1472-3 | BCOC PEST | 10 | ACETONE | NA |
| 3 | 1620-4 | PEST | 02/04/20 | ACETONE | 06/26/10 |
| 4 | 1667-1 | LOW PEST | 0.2/0.4/2 | ACETONE | 06/26/10 |
| 5 | 1677-1 | EPH | 1500 | MECL2 | 11/12/10 |
| 6 | 1655-3 | PCP | 12.5/125 | ACETONE | 09/24/10 |
| 7 | 1677-3 | ABN | 100 | ACETONE | 07/01/10 |
| 8 | 1681-4 | TBT | 2.5 | MECL2 | 12/01/10 |
| 9 | 1682-2 | PORE TBT | .125/.25 | MECL2 | 12/01/10 |
| 10 | 1621-4 | ABN ACID | 100/200 | MEOH | 07/14/10 |
| 11 | 1642-2 | TPHD | 15000 | ACETONE | 09/07/10 |
| 12 | 1622-2 | ABN BASE | 200 | ACETONE | 02/05/10 |
| 13 | 1613-1 | LOW PCB | 2 | ACETONE | 06/08/10 |
| 14* | 1547-1 | LOW ABN ACID | 10/20 | MEOH | 04/10/10 |
| 15* | 1591-3 | SIM PNA | 15/75 | MEOH | 08/28/10 |
| 16 | 1602-3 | DIOXANE | 100 | MEOH | 03/20/10 |
| 17 | 1644-1 | 1248 PCB | 10 | ACETONE | 09/10/10 |
| 18* | 1591-4 | LOW SIM PNA | 1.5 | ACETONE | 08/28/10 |
| 19 | 1685-3 | AK103 | 7500 | ACETONE | 09/03/10 |
| 20 | 1682-4 | PNA | 100 | ACETONE | 12/04/10 |
| 21 | 1593-3 | SKY/BHT | 100 | MEOH | 03/31/10 |
| 22 | 1675-1 | HERB | 12.5/12500 | MEOH | 02/19/10 |
| 23* | 1505-1 | LW ABN BASE | 20 | MEOH | 03/20/10 |
| 24 | 1613-2 | LOW ABN | 10 | ACETONE | 02/28/10 |
| 25# | 1481-1 | DIPHENYL | 100 | MEOH | NA |
| 26* | 1545-2 | OP-PEST | 25 | MEOH | 02/16/10 |
| 27 | 1668-3 | STEROLS | 200 | MEOH | 10/30/10 |
| 28# | 1684-1 | ADD. PEST | 4 | ACETONE | 03/25/10 |
| 29# | 1496-3 | DECANES | 100 | MEOH | NA |
| 30 | 1620-1 | EDB/DBCP | 0.2 | MEOH | 06/22/10 |
| 31 | 1596-1 | TERPINEOL | 100 | MEOH | 04/03/10 |

LCS SOLUTIONS

1/5/2010

| | | | | | |
|----|-----------------------------|-------------|--------|---------|----------|
| 32 | 1619-3 | GUAIACOL | 50-200 | ACETONE | 04/30/10 |
| 33 | 1639-3 | RETENE | 100 | MEOH | 09/03/10 |
| 34 | 1633-1 | CONGENERS | 2.5 | ACETONE | 08/11/10 |
| 35 | 1674-3 | ALKYL PNA A | 10 | MEOH | 10/28/10 |
| 36 | 1601-3 | ALKYL PNA B | 10 | MEOH | 05/13/10 |
| 50 | 1617-1 | FULL RESIN | 250 | ACETONE | 06/17/10 |
| 51 | 1611-3 | DDTS | 2.5 | ACETONE | 06/04/10 |
| 52 | 1613-5 | 1232 PCB | 20 | ACETONE | 06/16/10 |
| | | | | | |
| | *=REVERIFIED SOLUTION | | | | |
| | #=PROJECT SPECIFIC SOLUTION | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |



Spike Recovery Control Limits Analysis of PCB / Aroclors in Aqueous Samples - EPA SW-846 Methods 8081 & 8082 ^(1,2)

Effective 5/1/09

Control limits are updated periodically. Assure that you have ARI's current control limits by downloading the files at the time of use. <http://www.arilabs.com/portal/downloads/ARI-CLs.zip>

| Analytical Method: | Standard Analysis | MTCA Analysis | Low Level Analysis | Manchester Extraction |
|---|-------------------|-----------------|--------------------|-------------------------|
| Sample Weight / Final Volume: | 500 / 5 mL | 500 / 1 mL | 1000 / 0.5 mL | 3000 / 1 mL |
| LCS Spike Recovery ⁽⁴⁾ | | | | |
| Aroclor 1016 | 45 - 121 | 36 - 100 | 44 - 117 | 30 - 160 ⁽³⁾ |
| Aroclor 1260 | 54 - 129 | 41 - 113 | 46 - 131 | 30 - 160 ⁽³⁾ |
| | | | | |
| Method Blank/LCS Surrogate Recovery | | | | |
| Tetrachloro- <i>meta</i> -xylene (TCMX) | 40 - 118 | 29 - 100 | 31 - 100 | 30 - 160 ⁽³⁾ |
| Decachlorobiphenyl | 41 - 111 | 35 - 116 | 32 - 108 | 30 - 160 ⁽³⁾ |
| | | | | |
| Sample Surrogate Recovery | | | | |
| Tetrachloro- <i>meta</i> -xylene (TCMX) | 38 - 118 | 25 - 100 | 21 - 100 | 30 - 160 ⁽³⁾ |
| Decachlorobiphenyl | 29 - 118 | 10 - 128 | 19 - 111 | 30 - 160 ⁽³⁾ |

(1) Control Limits calculated using all data generated 1/1/08 through 12/1/08.

(2) Highlighted control limits (**bold font**) adjusted to demonstrate that ARI does not use control limits < 10 for the lower limit or < 100 for the upper limit.

(3) 30 - 160 are default, advisory control limits used when there is insufficient data to calculate historic control limits. **DO NOT** use these limits as the sole reason to reject the data from a batch of analyses.

(4) Laboratory Control Sample (LCS) spike recovery control limits also used as advisory control limits for sample matrix spike (MS) analyzes. MS recovery values are advisory and not used to assess the acceptability of an analytical batch.



Summary of Laboratory Control Limits Metals Analyses (All Methods & Sample Matrices)

Effective 5/1/09

Control limits are updated periodically. Assure that you have ARI's current control limits by downloading the files at the time of use. <http://www.arilabs.com/portal/downloads/ARI-CLs.zip>

| Element | Matrix Spike Recovery | LCS Recovery | Replicate RPD |
|-----------|-----------------------|--------------|---------------|
| Aluminum | 75 - 125 | 80 - 120 | ≤ 20% |
| Antimony | 75 - 125 | 80 - 120 | ≤ 20% |
| Arsenic | 75 - 125 | 80 - 120 | ≤ 20% |
| Barium | 75 - 125 | 80 - 120 | ≤ 20% |
| Beryllium | 75 - 125 | 80 - 120 | ≤ 20% |
| Boron | 75 - 125 | 80 - 120 | ≤ 20% |
| Cadmium | 75 - 125 | 80 - 120 | ≤ 20% |
| Calcium | 75 - 125 | 80 - 120 | ≤ 20% |
| Chromium | 75 - 125 | 80 - 120 | ≤ 20% |
| Cobalt | 75 - 125 | 80 - 120 | ≤ 20% |
| Copper | 75 - 125 | 80 - 120 | ≤ 20% |
| Iron | 75 - 125 | 80 - 120 | ≤ 20% |
| Lead | 75 - 125 | 80 - 120 | ≤ 20% |
| Magnesium | 75 - 125 | 80 - 120 | ≤ 20% |
| Manganese | 75 - 125 | 80 - 120 | ≤ 20% |
| Mercury | 75 - 125 | 80 - 120 | ≤ 20% |
| Nickel | 75 - 125 | 80 - 120 | ≤ 20% |
| Potassium | 75 - 125 | 80 - 120 | ≤ 20% |
| Selenium | 75 - 125 | 80 - 120 | ≤ 20% |
| Silica | 75 - 125 | 80 - 120 | ≤ 20% |
| Silver | 75 - 125 | 80 - 120 | ≤ 20% |
| Sodium | 75 - 125 | 80 - 120 | ≤ 20% |
| Strontium | 75 - 125 | 80 - 120 | ≤ 20% |
| Thallium | 75 - 125 | 80 - 120 | ≤ 20% |
| Vanadium | 75 - 125 | 80 - 120 | ≤ 20% |
| Zinc | 75 - 125 | 80 - 120 | ≤ 20% |

Data Summary Package

**prepared
for**

The Boeing Company

Project: Boeing Plant 2 Source Control

ARI JOB NO: QF18, QF21

**prepared
by**

Analytical Resources, Inc.

PCB ANALYSIS


ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082
Page 1 of 1

Sample ID: PL2SC-EB1-011210
SAMPLE

Lab Sample ID: QF18A

LIMS ID: 10-705

Matrix: Water

Data Release Authorized: 

Reported: 01/20/10

QC Report No: QF18-The Boeing Company

Project: Boeing Plant 2 Source Control

Date Sampled: 01/12/10

Date Received: 01/12/10

Date Extracted: 01/14/10

Date Analyzed: 01/18/10 16:10

Instrument/Analyst: ECD5/JGR

GPC Cleanup: No

Sulfur Cleanup: Yes

Sample Amount: 500 mL

Final Extract Volume: 5.0 mL

Dilution Factor: 1.00

Silica Gel: No

Acid Cleanup: Yes

| CAS Number | Analyte | RL | Result |
|------------|--------------|-----|---------|
| 12674-11-2 | Aroclor 1016 | 1.0 | < 1.0 U |
| 53469-21-9 | Aroclor 1242 | 1.0 | < 1.0 U |
| 12672-29-6 | Aroclor 1248 | 1.0 | < 1.0 U |
| 11097-69-1 | Aroclor 1254 | 1.0 | < 1.0 U |
| 11096-82-5 | Aroclor 1260 | 1.0 | < 1.0 U |
| 11104-28-2 | Aroclor 1221 | 1.0 | < 1.0 U |
| 11141-16-5 | Aroclor 1232 | 1.0 | < 1.0 U |

Reported in $\mu\text{g/L}$ (ppb)

PCB Surrogate Recovery

| | |
|-----------------------|-------|
| Decachlorobiphenyl | 53.8% |
| Tetrachlorometaxylene | 73.5% |

SW8082/PCB WATER SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: QF18-The Boeing Company
Project: Boeing Plant 2 Source Control

| Client ID | DCBP % REC | DCBP LCL-UCL | TCMX % REC | TCMX LCL-UCL | TOT OUT |
|------------------|---------------|-----------------|---------------|-----------------|---------|
| MB-011410 | 66.2% | 41-111 | 76.2% | 40-118 | 0 |
| LCS-011410 | 57.5% | 41-111 | 72.5% | 40-118 | 0 |
| LCSD-011410 | 56.5% | 41-111 | 73.5% | 40-118 | 0 |
| PL2SC-EB1-011210 | 53.8% | 29-118 | 73.5% | 38-118 | 0 |

Prep Method: SW3510C
Log Number Range: 10-705 to 10-705

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082
Page 1 of 1

Sample ID: LCS-011410
LCS/LCSD

Lab Sample ID: LCS-011410
LIMS ID: 10-705
Matrix: Water
Data Release Authorized: *[Signature]*
Reported: 01/20/10

QC Report No: QF18-The Boeing Company
Project: Boeing Plant 2 Source Control

Date Sampled: NA
Date Received: NA

Date Extracted LCS/LCSD: 01/14/10

Sample Amount LCS: 500 mL
LCSD: 500 mL

Date Analyzed LCS: 01/18/10 14:44
LCSD: 01/18/10 15:06

Final Extract Volume LCS: 5.0 mL
LCSD: 5.0 mL

Instrument/Analyst LCS: ECD5/JGR
LCSD: ECD5/JGR

Dilution Factor LCS: 1.00
LCSD: 1.00

GPC Cleanup: No
Sulfur Cleanup: Yes

Silica Gel: No
Acid Cleanup: Yes

| Analyte | LCS | Spike Added-LCS | LCS Recovery | LCSD | Spike Added-LCSD | LCSD Recovery | RPD |
|--------------|------|--------------------|-----------------|------|---------------------|------------------|------|
| Aroclor 1016 | 4.84 | 5.00 | 96.8% | 4.92 | 5.00 | 98.4% | 1.6% |
| Aroclor 1260 | 3.89 | 5.00 | 77.8% | 3.95 | 5.00 | 79.0% | 1.5% |

PCB Surrogate Recovery

| | LCS | LCSD |
|-----------------------|-------|-------|
| Decachlorobiphenyl | 57.5% | 56.5% |
| Tetrachlorometaxylene | 72.5% | 73.5% |

Results reported in $\mu\text{g/L}$
RPD calculated using sample concentrations per SW846.

4
PCB METHOD BLANK SUMMARY

BLANK NO.

QF17MBW1

Lab Name: ANALYTICAL RESOURCES, INC

Client: THE BOEING COMPANY

ARI Job No.: QF18

Project: BOEING PLANT 2 SOURCE CONTROL

Lab Sample ID: QF17MBW1

Lab File ID: 0118B022

Date Extracted: 01/14/10

Matrix: LIQUID

Date Analyzed: 01/18/10

Instrument ID: ECD5

Time Analyzed: 1423

GC Columns: ZB5/ZB35

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

| | CLIENT SAMPLE NO. ===== | LAB SAMPLE ID ===== | DATE ANALYZED ===== |
|----|-------------------------------|---------------------------|---------------------------|
| 01 | QF17LCSW1 | QF17LCSW1 | 01/18/10 |
| 02 | QF17LCSDW1 | QF17LCSDW1 | 01/18/10 |
| 03 | PL2SC-EB1-011210 | QF18A | 01/18/10 |

ALL RUNS ARE DUAL COLUMN

ORGANICS ANALYSIS DATA SHEET

PCB by GC/ECD Method SW8082

Page 1 of 1

Sample ID: MB-011410

METHOD BLANK

Lab Sample ID: MB-011410

LIMS ID: 10-705

Matrix: Water

Data Release Authorized: *[Signature]*

Reported: 01/20/10

QC Report No: QF18-The Boeing Company

Project: Boeing Plant 2 Source Control

Date Sampled: NA

Date Received: NA

Date Extracted: 01/14/10

Date Analyzed: 01/18/10 14:23

Instrument/Analyst: ECD5/JGR

GPC Cleanup: No

Sulfur Cleanup: Yes

Sample Amount: 500 mL

Final Extract Volume: 5.0 mL

Dilution Factor: 1.00

Silica Gel: No

Acid Cleanup: Yes

| CAS Number | Analyte | RL | Result |
|------------|--------------|-----|---------|
| 12674-11-2 | Aroclor 1016 | 1.0 | < 1.0 U |
| 53469-21-9 | Aroclor 1242 | 1.0 | < 1.0 U |
| 12672-29-6 | Aroclor 1248 | 1.0 | < 1.0 U |
| 11097-69-1 | Aroclor 1254 | 1.0 | < 1.0 U |
| 11096-82-5 | Aroclor 1260 | 1.0 | < 1.0 U |
| 11104-28-2 | Aroclor 1221 | 1.0 | < 1.0 U |
| 11141-16-5 | Aroclor 1232 | 1.0 | < 1.0 U |

Reported in $\mu\text{g/L}$ (ppb)

PCB Surrogate Recovery

| | |
|-----------------------|-------|
| Decachlorobiphenyl | 66.2% |
| Tetrachlorometaxylene | 76.2% |

METALS ANALYSIS

INORGANICS ANALYSIS DATA SHEET

DISSOLVED METALS


Page 1 of 1

Sample ID: PL2SC-EB1-011210
SAMPLE

Lab Sample ID: QF18A

LIMS ID: 10-705

Matrix: Water

Data Release Authorized 

Reported: 01/19/10

QC Report No: QF18-The Boeing Company

Project: Boeing Plant 2 Source Control

Date Sampled: 01/12/10

Date Received: 01/12/10

| Prep Meth | Prep Date | Analysis Method | Analysis Date | CAS Number | Analyte | RL | µg/L | Q |
|--------------|--------------|--------------------|------------------|------------|----------|-----|------|---|
| 200.8 | 01/13/10 | 200.8 | 01/18/10 | 7440-38-2 | Arsenic | 0.2 | 0.2 | U |
| 6010B | 01/13/10 | 6010B | 01/18/10 | 7440-43-9 | Cadmium | 2 | 2 | U |
| 6010B | 01/13/10 | 6010B | 01/18/10 | 7440-47-3 | Chromium | 5 | 5 | U |
| 6010B | 01/13/10 | 6010B | 01/18/10 | 7440-50-8 | Copper | 2 | 2 | U |
| 200.8 | 01/13/10 | 200.8 | 01/18/10 | 7439-92-1 | Lead | 1 | 1 | U |
| 6010B | 01/13/10 | 6010B | 01/18/10 | 7440-22-4 | Silver | 3 | 3 | U |
| 6010B | 01/13/10 | 6010B | 01/18/10 | 7440-66-6 | Zinc | 10 | 10 | U |

U-Analyte undetected at given RL
RL-Reporting Limit

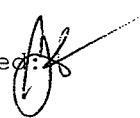
INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS
Page 1 of 1

Sample ID: METHOD BLANK

Lab Sample ID: QF18MB

LIMS ID: 10-705

Matrix: Water

Data Release Authorized: 

Reported: 01/19/10

QC Report No: QF18-The Boeing Company

Project: Boeing Plant 2 Source Control

Date Sampled: NA

Date Received: NA

| Prep Meth | Prep Date | Analysis Method | Analysis Date | CAS Number | Analyte | RL | µg/L | Q |
|--------------|--------------|--------------------|------------------|------------|----------|-----|------|---|
| 200.8 | 01/13/10 | 200.8 | 01/18/10 | 7440-38-2 | Arsenic | 0.2 | 0.2 | U |
| 6010B | 01/13/10 | 6010B | 01/18/10 | 7440-43-9 | Cadmium | 2 | 2 | U |
| 6010B | 01/13/10 | 6010B | 01/18/10 | 7440-47-3 | Chromium | 5 | 5 | U |
| 6010B | 01/13/10 | 6010B | 01/18/10 | 7440-50-8 | Copper | 2 | 2 | U |
| 200.8 | 01/13/10 | 200.8 | 01/18/10 | 7439-92-1 | Lead | 1 | 1 | U |
| 6010B | 01/13/10 | 6010B | 01/18/10 | 7440-22-4 | Silver | 3 | 3 | U |
| 6010B | 01/13/10 | 6010B | 01/18/10 | 7440-66-6 | Zinc | 10 | 10 | U |

U-Analyte undetected at given RL

RL-Reporting Limit

INORGANICS ANALYSIS DATA SHEET

DISSOLVED METALS

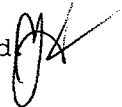
Page 1 of 1

Sample ID: LAB CONTROL

Lab Sample ID: QF18LCS

LIMS ID: 10-705

Matrix: Water

Data Release Authorized 

Reported: 01/19/10

QC Report No: QF18-The Boeing Company

Project: Boeing Plant 2 Source Control

Date Sampled: NA

Date Received: NA

BLANK SPIKE QUALITY CONTROL REPORT

| Analyte | Analysis Method | Spike Found | Spike Added | % Recovery | Q |
|----------|-----------------|-------------|-------------|------------|---|
| Arsenic | 200.8 | 26.2 | 25.0 | 105% | |
| Cadmium | 6010B | 578 | 500 | 116% | |
| Chromium | 6010B | 543 | 500 | 109% | |
| Copper | 6010B | 535 | 500 | 107% | |
| Lead | 200.8 | 23 | 25 | 92.0% | |
| Silver | 6010B | 586 | 500 | 117% | |
| Zinc | 6010B | 530 | 500 | 106% | |


Reported in µg/L

N-Control limit not met

Control Limits: 80-120%

INORGANICS ANALYSIS DATA SHEET
Dissolved Mercury by Method SW7470A



Data Release Authorized: 
Reported: 01/15/10
Date Received: 01/12/10
Page 1 of 1

QC Report No: QF21-The Boeing Company
Project: Boeing Plant 2 Source Control

| Client/ ARI ID | Date Sampled | Matrix | Prep Date Anal Date | RL | Result |
|-------------------|-----------------|--------|------------------------|------|--------|
| PL2SC-EB1-011210 | 01/12/10 | Water | 01/13/10 | 20.0 | 20.0 U |
| QF21A 10-725 | | | 01/14/10 | | |
| MB-011310 | NA | Water | 01/13/10 | 20.0 | 20.0 U |
| Method Blank | | | 01/14/10 | | |

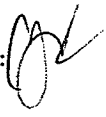
Reported in ng/L

RL-Analytical reporting limit
U-Undetected at reported detection limit

MERCURY ANALYSIS

INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS
Page 1 of 1

Sample ID: PL2SC-EB1-011210
DUPLICATE

Lab Sample ID: QF21A
LIMS ID: 10-725
Matrix: Water
Data Release Authorized: 
Reported: 01/15/10

QC Report No: QF21-The Boeing Company
Project: Boeing Plant 2 Source Control
Date Sampled: 01/12/10
Date Received: 01/12/10

MATRIX DUPLICATE QUALITY CONTROL REPORT

| Analyte | Analysis Method | Sample | Duplicate | RPD | Control Limit | Q |
|---------|-----------------|--------|-----------|------|---------------|---|
| Mercury | 7470A | 20.0 U | 20.0 U | 0.0% | +/- 20.0 | L |

Reported in ng/L

*-Control Limit Not Met
L-RPD Invalid, Limit = Detection Limit

INORGANICS ANALYSIS DATA SHEET

DISSOLVED METALS

Page 1 of 1


Sample ID: PL2SC-EB1-011210

MATRIX SPIKE

Lab Sample ID: QF21A

LIMS ID: 10-725

Matrix: Water

Data Release Authorized 

Reported: 01/15/10

QC Report No: QF21-The Boeing Company

Project: Boeing Plant 2 Source Control

Date Sampled: 01/12/10

Date Received: 01/12/10

MATRIX SPIKE QUALITY CONTROL REPORT

| Analyte | Analysis Method | Sample | Spike | Spike Added | % Recovery | Q |
|---------|-----------------|--------|-------|-------------|------------|---|
| Mercury | 7470A | 20.0 U | 96.8 | 100 | 96.8% | |

Reported in ng/L

N-Control Limit Not Met

H-% Recovery Not Applicable, Sample Concentration Too High

NA-Not Applicable, Analyte Not Spiked

Percent Recovery Limits: 75-125%

INORGANICS ANALYSIS DATA SHEET

DISSOLVED METALS

Page 1 of 1

Sample ID: LAB CONTROL

Lab Sample ID: QF21LCS

LIMS ID: 10-725

Matrix: Water

Data Release Authorized: *GL*

Reported: 01/15/10

QC Report No: QF21-The Boeing Company

Project: Boeing Plant 2 Source Control

Date Sampled: NA

Date Received: NA

BLANK SPIKE QUALITY CONTROL REPORT

| Analyte | Analysis Method | Spike Found | Spike Added | % Recovery | Q |
|---------|-----------------|-------------|-------------|------------|---|
| Mercury | 7470A | 183 | 200 | 91.5% | |

Reported in ng/L

N-Control limit not met

Control Limits: 80-120%



Analytical Resources, Incorporated
Analytical Chemists and Consultants

March 2, 2010

Kent Angelos
Golder Associates, Inc.
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

RE: Boeing Plant 2 Source Control
ARI IDs: QI23 / QI24 / QI75 / QI78 / QI90

Dear Kent:

Please find enclosed the original Chain-of-Custody (COC) records, sample receipt documentation, and the final data package for the project referenced above.

Sample receipt information and analytical details are addressed in the Case Narrative.

An electronic copy of this package will be kept on file at ARI. If you have any questions or require additional information, please contact me at your convenience.

Sincerely,
ANALYTICAL RESOURCES, INC.

Cheronne Oreiro
Project Manager
-For-
Kelly Bottem
Client Services Manager
(206) 695-6211
kellyb@arilabs.com
www.arilabs.com

KB/eb

cc: Kent Angelos, Golder Associates Inc., 18300 NE Union Hill Road, Suite 200, Redmond, WA 98052-3333

Chain of Custody
Documentation

prepared
for

The Boeing Company

Project: PL2 Source Control

ARI JOB NO: QI23, QI24, QI75, QI78, QI90

prepared
by

Analytical Resources, Inc.

QI23:00002

| | |
|-------------------|-------------------|
| Page: 1 | of 1 |
| Date: 2/3/2018 | Ice Present? Yes |
| No. of Coolers: 1 | Cooler Temps: 3.4 |

| | | |
|----------------------|------------|------------------------|
| ARI Assigned Number: | 0123 | Turn-around Requested: |
| ARI Client Company: | Boeing | |
| Client Contact: | Will Ernst | |

| | | |
|----------------------|----------------------|-----------------------------------|
| Client Project Name: | Box 2 Source Control | |
| Client Project #: | | Samplers: Lr2 Shear J111 Lande-15 |

| Sample ID | Date | Time | Matrix | No. Containers |
|-----------|------|------|--------|----------------|
|-----------|------|------|--------|----------------|

| | | | | |
|--------------------|--------|------|---|---|
| PASC-W-JSDA-020310 | 2/3/10 | 1530 | W | 3 |
|--------------------|--------|------|---|---|

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| Comments/Special Instructions | Relinquished by: (Signature) <i>E. J. [Signature]</i> | Received by: (Signature) <i>[Signature]</i> |
|-------------------------------|--|--|

Printed Name: Elizabeth Shea
Printed Name: MIKKA

| | |
|----------|------------------------|
| per QAPP | Company: <i>Golden</i> |
| | Company: <i>A</i> |

| Date & Time: | Date & Time: |
|---------------|--------------|
| 2/3/2010 1624 | 23/10 |

Limits of Liability: ARI will perform all requested services in accordance with appropriate means and methods that meet industry standards for the industry. The total liability of ARI, its officers, agents, employees, or subcontractors shall not exceed the amount of the fee for the services performed.

said services. The acceptance by the client of a proposal for services by ARI release ARI from the client's custody, and the signed agreement between ARI and the Client.

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no so

retention schedules have been established by work-order or contract.

Analytical Resources, Incorporated
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)

[illegible]

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Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.



Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: BOEING

Project Name: BP2 Source Control

COC No(s): _____ (NA)

Delivered by: Fed-Ex UPS Courier Hand Delivered Other: _____

Assigned ARI Job No: Q123

Tracking No: _____ (NA)

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to cooler? _____

YES (NO)

Were custody papers included with the cooler? _____

(YES) NO

Were custody papers properly filled out (ink, signed, etc.) _____

(YES) NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry)..... 3.4

If cooler temperature is out of compliance fill out form 00070F

Temp Gun ID#: 90877952

Cooler Accepted by: MM Date: 2/3/10 Time: 1624

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler? _____

YES (NO)

What kind of packing material was used? ... Bubble Wrap (Wet Ice) Gel Packs Baggies Foam Block Paper Other: _____

Was sufficient ice used (if appropriate)? _____

NA (YES) NO

Were all bottles sealed in individual plastic bags? _____

YES (NO)

Did all bottles arrive in good condition (unbroken)? _____

(YES) NO

Were all bottle labels complete and legible? _____

(YES) NO

Did the number of containers listed on COC match with the number of containers received? _____

(YES) NO

Did all bottle labels and tags agree with custody papers? _____

(YES) NO

Were all bottles used correct for the requested analyses? _____

(YES) NO

Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)...

NA (YES) NO

Were all VOC vials free of air bubbles? _____

(NA) YES NO

Was sufficient amount of sample sent in each bottle? _____

(YES) NO

Date VOC Trip Blank was made at ARI.....

(NA)

Samples Logged by: AV Date: 2/3/10 Time: 1630

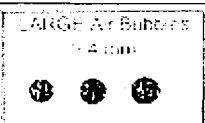
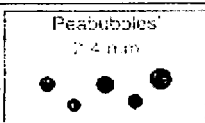
**** Notify Project Manager of discrepancies or concerns ****

| Sample ID on Bottle | Sample ID on COC | Sample ID on Bottle | Sample ID on COC |
|---------------------|------------------|---------------------|------------------|
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Additional Notes, Discrepancies, & Resolutions:

By: _____

Date: _____



Small → "sm"

Peabubbles → "pb"

Large → "lg"

Headspace → "hs"



ARI Job No: QI23
PC: Kelly
VTSR: 02/03/10

Inquiry Number: NONE
Analysis Requested: 02/04/10
Contact: Ernst, Will
Client: The Boeing Company
Logged by: AV
Sample Set Used: Yes-481
Validatable Package: ~~No~~ *Yes*
Deliverables:

Project #:
Project: BP2 Source Control
Sample Site:
SDG No:
Analytical Protocol: In-house

| LOGNUM | ARI ID | CLIENT ID | CN | WAD | NH3 | COD | FOG | MET | PHEN | PHOS | TKN | NO23 | TOC | S2 | AK102 | Fe2+ | DMET | DOC | FLT | FLT | PARAMETER | ADJUSTED | LOT | AMOUNT | DATE/BY |
|---------|--------|----------------------|-----|-----|-----|-----|-----|-----|------|------|-----|------|-----|----|-------|------|------|-----|-----|-----|-----------|----------|-----|--------|---------|
| 10-2712 | | | >12 | >12 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | >9 | <2 | <2 | Y | | | | | | | | |
| QI23A | | PL2SC-W-J505A-020310 | | | | | | DIS | | | | | | | | | | | | | | | | | |

QI23: 00005

Checked By AV Date 2/3/10

PC: Kelly

VTSR: 02/03/10

Project #:
Project: BP2 Source Control
Sample Site:
SDG No:
Analytical Protocol: In-house

Inquiry Number: P2DG
Analysis Requested: 02/03/10
Contact: Ernst, Will
Client: The Boeing Company
Logged by: JP
Sample Set Used: Yes-320
Validatable Package: Yes
Deliverables:

[illegible]

0123 000006

Checked By SR Date 2/3/16



Analytical Resources, Incorporated
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)

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Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.



Cooler Receipt Form

ARI Client: Boeing
COC No(s): _____ NA
Assigned ARI Job No: Q123

Project Name: Source Control
Delivered by: Fed-Ex UPS Courier Hand Delivered Other: _____
Tracking No: _____ NA

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to cooler? YES NO
Were custody papers included with the cooler? YES NO
Were custody papers properly filled out (ink, signed, etc.) YES NO
Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry) AMB _____
If cooler temperature is out of compliance fill out form 00070F Temp Gun ID#: _____
Cooler Accepted by: AV Date: 2/5/10 Time: 1234
Complete custody forms and attach all shipping documents

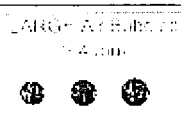
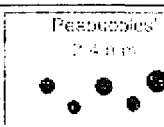
Log-In Phase:

Was a temperature blank included in the cooler? YES NO
What kind of packing material was used? ... Bubble Wrap Wet Ice Gel Packs Baggies Foam Block Paper Other: _____
Was sufficient ice used (if appropriate)? NA YES NO
Were all bottles sealed in individual plastic bags? YES NO
Did all bottles arrive in good condition (unbroken)? YES NO
Were all bottle labels complete and legible? YES NO
Did the number of containers listed on COC match with the number of containers received? YES NO
Did all bottle labels and tags agree with custody papers? YES NO
Were all bottles used correct for the requested analyses? YES NO
Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)... NA YES NO
Were all VOC vials free of air bubbles? NA YES NO
Was sufficient amount of sample sent in each bottle? YES NO
Date VOC Trip Blank was made at ARI NA _____
Samples Logged by: AV Date: 2/5/10 Time: 11236
**** Notify Project Manager of discrepancies or concerns ****

| Sample ID on Bottle | Sample ID on COC | Sample ID on Bottle | Sample ID on COC |
|---------------------|------------------|---------------------|------------------|
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Additional Notes, Discrepancies, & Resolutions:

By: _____ Date: _____



Small → "sm"
Peabubbles → "pb"
Large → "lg"
Headspace → "hs"

Analytical Resources, Incorporated
Analytical Chemists and Consultants
46611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)



| | |
|-------------------|--|
| Page: 1 | of 1 |
| Date: 2/5/2010 | Ice Present? <input checked="" type="checkbox"/> |
| No. of Coolers: 1 | Cooler Temps: 4.8 |

| | | | |
|----------------------|------------|------------------------|-----|
| ARI Assigned Number: | Q170 | Turn-around Requested: | Std |
| ARI Client Company: | Boeing | Phone: | |
| Client Contact: | Will Ernst | | |

| | |
|----------------------|----------------------|
| Client Project Name: | MS Source Control |
| Client Project #: | Samplers: LS, JL, KM |

[illegible]

| Comments/Special Instructions | Relinquished by: (Signature) | Received by: (Signature) |
|------------------------------------|---------------------------------|-----------------------------|
| SMS Metals per clapp -see PM | <i>[Signature]</i> | <i>[Signature]</i> |
| | Printed Name: Liz Shea | Printed Name: S. Shea |
| | Company: Golder | Company: Hill |
| | Date & Time: 2/5/2014 1649 | Date & Time: 2/5 |

[illegible]

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Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.



Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: Boeing
COC No(s): NA
Assigned ARI Job No: GI78

Project Name: PL2 Source Control
Delivered by: Fed-Ex UPS Courier Hand Delivered Other: NA
Tracking No: NA

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to cooler? YES NO
Were custody papers included with the cooler? YES NO
Were custody papers properly filled out (ink, signed, etc.) YES NO
Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry) 7.8
If cooler temperature is out of compliance fill out form 00070F Temp Gun ID#: 90941019
Cooler Accepted by: JP Date: 2/5/10 Time: 1650

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler? YES NO
What kind of packing material was used? ... Bubble Wrap Wet Ice Gel Packs Baggies Foam Block Paper Other: NA
Was sufficient ice used (if appropriate)? NA YES NO
Were all bottles sealed in individual plastic bags? YES NO
Did all bottles arrive in good condition (unbroken)? YES NO
Were all bottle labels complete and legible? YES NO
Did the number of containers listed on COC match with the number of containers received? YES NO
Did all bottle labels and tags agree with custody papers? YES NO
Were all bottles used correct for the requested analyses? YES NO
Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)... NA YES NO
Were all VOC vials free of air bubbles? NA YES NO
Was sufficient amount of sample sent in each bottle? YES NO
Date VOC Trip Blank was made at ARI: NA

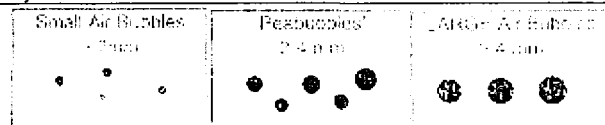
Samples Logged by: JP Date: 2/5/10 Time: 1750

**** Notify Project Manager of discrepancies or concerns ****

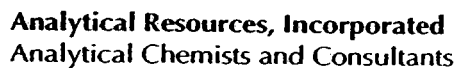
| Sample ID on Bottle | Sample ID on COC | Sample ID on Bottle | Sample ID on COC |
|---------------------|------------------|---------------------|------------------|
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Additional Notes, Discrepancies, & Resolutions:

By: _____ Date: _____



Small → "sm"
Peabubbles → "pb"
Large → "lg"
Headspace → "hs"



Cooler Temperature Compliance Form

0070F



ARI Job No: Q178

PC: Kelly
VTSR: 02/05/10

Inquiry Number: NONE
Analysis Requested: 02/05/10
Contact: Ernst, Will
Client: The Boeing Company
Logged by: JP
Sample Set Used: Yes-481
Validatable Package: Yes
Deliverables:

Project #:
Project: PL2 Source Control
Sample Site:
SDG No:
Analytical Protocol: In-house

| LOGNUM | ARI ID | CLIENT ID | CN | WAD | NH3 | COD | FOG | MET | PHEN | PHOS | TKN | NO23 | TOC | S2 | AK102 | Fe2+ | DMET | DOC | FLT | FLT | PARAMETER | ADJUSTED TO | LOT NUMBER | AMOUNT ADDED | DATE/BY |
|---------|--------|------------------|----|-----|-----|-----|-----|-----|------|------|-----|------|-----|----|-------|------|------|-----|-----|-----|-----------|-------------|------------|--------------|---------|
| 10-3259 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Q178A | | PL2SC-EB3-020510 | | | | | | DIS | | | | | | | | | | | Y | | | | | | |

Q123: 00012

Checked By JP Date 2/6/10



ARI Job No: QI90

PC: Kelly
VTSR: 02/05/10

Inquiry Number: NONE
Analysis Requested: 02/05/10
Contact: Ernst, Will
Client: The Boeing Company
Logged by: JP
Sample Set Used: Yes-481
Validatable Package: Yes
Deliverables:

Project #:
Project: PL2 Source Control
Sample Site:
SDG No:
Analytical Protocol: In-house

| LOGNUM | ARI ID | CLIENT ID | CN | WAD | NH3 | COD | FOG | MET | PHEN | PHOS | TKN | NO23 | TOC | S2 | AK102 | Fe2+ | DMET | DOC | FLT | FLT | PARAMETER | ADJUSTED TO | LOT NUMBER | AMOUNT ADDED | DATE/BY |
|---------|--------|------------------|----|-----|-----|-----|-----|-----|------|------|-----|------|-----|----|-------|------|------|-----|-----|-----|-----------|-------------|------------|--------------|---------|
| 10-3260 | QI90A | PL2SC-EB3-020510 | | | | | | | | | | | | | | | | | | | | | | | |

QI23: 00013

Checked By JP Date 2/8/10

Case Narrative

prepared
for

The Boeing Company

Project: PL2 Source Control

ARI JOB NO: QI23, QI24, QI75, QI78, QI90

prepared
by

Analytical Resources, Inc.

**Case Narrative****Project: Boeing Plant 2 Source Control****ARI IDs: QI23 / QI24 / QI75 / QI78 / QI90****Matrix: Water****Date: March 2, 2010****Sample Receipt Information**

One water sample was received in good condition at Analytical Resources, Inc. (ARI) on February 3, 2010 under ARI Sample Delivery Groups (SDGs) QI23 and QI24. The cooler temperature, as measured by IR thermometer, was 3.4°C. For further details regarding sample receipt, please refer to the enclosed Cooler Receipt Form and Preservation Verification sheet.

One soil sample and one filter bag sample were received in good condition at ARI on February 5, 2010 under SDG QI75. The samples were received at room temperature. For further details regarding sample receipt, please refer to the enclosed Cooler Receipt Form and Preservation Verification sheet.

One water sample was received in good condition at ARI on February 3, 2010 under SDGs QI78 and QI90. The cooler temperature, as measured by IR thermometer, was 7.8°C. For further details regarding sample receipt, please refer to the enclosed Cooler Receipt Form and Preservation Verification sheet.

The samples were analyzed for the parameters listed below, as requested on the Chain of Custodies.

PCBs by Method 8082

The samples were extracted on 2/10/10 and analyzed between 2/11/10 and 2/12/10 - within the method recommended holding time.

Initial calibration(s): All analytes of interest were within method acceptance criteria.

Continuing calibration(s): The closing 2/12/10 CCAL was out of control low on the second column for both Aroclor 1248 and 1260. The CCAL was re-analyzed and Aroclor 1248 was within control limits and Aroclor 1260 was out of control slightly low. The first column was within control limits for both analyses. No corrective action was required.

Internal Standards: The internal standards were in control.

Surrogates: All surrogate recoveries were within control limits.

Method Blank(s): The method blanks were free of contamination.

Samples: There were no anomalies associated with these samples.

LCS/LCSD(s): The LCS and LCSD were in control.



Case Narrative

Project: Boeing Plant 2 Source Control

ARI IDs: QI23 / QI24 / QI75 / QI78 / QI90

Matrix: Water

Date: March 2, 2010

Total & Dissolved Metals by Methods 6010B, 200.8, 7470A and 7471A

The samples were digested between 2/5/10 and 2/10/10. The digests were analyzed between 2/15/10 and 2/23/10 - within the method recommended holding time.

Samples: No anomalies were encountered for these samples.

Lab Control(s): All percent recoveries were within control.

Method Blank(s): Copper and zinc were present in the method blank for QI75 at levels that were greater than the reporting limits. The associated sample contained concentrations of these elements that were greater than ten times the levels found in the method blank. No corrective action was required.

Dissolved Low-Level Mercury by Method 7470A

The samples were digested on 02/09/10 and 02/10/10. The digests were analyzed on 02/11/10 - within the method recommended holding time.

Samples: No anomalies were encountered for these samples.

Lab Control(s): All percent recoveries were within control.

Method Blank(s): The method blank was free of contamination.

pH by Method 150.1

The sample was analyzed on 2/3/10 - within the method recommended holding time.

Samples: No anomalies were encountered for these samples.

Replicate(s): RPDs/RSDs were in control.

Lab Control(s): All percent recoveries were within compliance.



Data Reporting Qualifiers

Effective 7/10/2009

Inorganic Data

- U Indicates that the target analyte was not detected at the reported concentration
- * Duplicate RPD is not within established control limits
- B Reported value is less than the CRDL but \geq the Reporting Limit
- N Matrix Spike recovery not within established control limits
- NA Not Applicable, analyte not spiked
- H The natural concentration of the spiked element is so much greater than the concentration spiked that an accurate determination of spike recovery is not possible
- L Analyte concentration is ≤ 5 times the Reporting Limit and the replicate control limit defaults to ± 1 RL instead of the normal 20% RPD

Organic Data

- U Indicates that the target analyte was not detected at the reported concentration
- * Flagged value is not within established control limits
- B Analyte detected in an associated Method Blank at a concentration greater than one-half of ARI's Reporting Limit or 5% of the regulatory limit or 5% of the analyte concentration in the sample.
- J Estimated concentration when the value is less than ARI's established reporting limits
- D The spiked compound was not detected due to sample extract dilution
- E Estimated concentration calculated for an analyte response above the valid instrument calibration range. A dilution is required to obtain an accurate quantification of the analyte.
- Q Indicates a detected analyte with an initial or continuing calibration that does not meet established acceptance criteria ($<20\%$ RSD, $<20\%$ Drift or minimum RRF).
- S Indicates an analyte response that has saturated the detector. The calculated concentration is not valid; a dilution is required to obtain valid quantification of the analyte



- NA The flagged analyte was not analyzed for
- NR Spiked compound recovery is not reported due to chromatographic interference
- NS The flagged analyte was not spiked into the sample
- M Estimated value for an analyte detected and confirmed by an analyst but with low spectral match parameters. This flag is used only for GC-MS analyses
- M2 The sample contains PCB congeners that do not match any standard Aroclor pattern. The PCBs are identified and quantified as the Aroclor whose pattern most closely matches that of the sample. The reported value is an estimate.
- N The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification"
- Y The analyte is not detected at or above the reported concentration. The reporting limit is raised due to chromatographic interference. The Y flag is equivalent to the U flag with a raised reporting limit.
- C The analyte was positively identified on only one of two chromatographic columns. Chromatographic interference prevented a positive identification on the second column
- P The analyte was detected on both chromatographic columns but the quantified values differ by $\geq 40\%$ RPD with no obvious chromatographic interference

Geotechnical Data

- A The total of all fines fractions. This flag is used to report total fines when only sieve analysis is requested and balances total grain size with sample weight.
- F Samples were frozen prior to particle size determination
- SM Sample matrix was not appropriate for the requested analysis. This normally refers to samples contaminated with an organic product that interferes with the sieving process and/or moisture content, porosity and saturation calculations
- SS Sample did not contain the proportion of "fines" required to perform the pipette portion of the grain size analysis
- W Weight of sample in some pipette aliquots was below the level required for accurate weighting

LCS SOLUTIONS

2/2/2010

| LABL | SOLN ID | TEST | CONC. UG/ML | SOLVENT | EXP. |
|------|---------|--------------|-------------|---------|----------|
| 1 | 1686-1 | PCB 1660 | 20 | ACETONE | 09/01/10 |
| 2# | 1472-3 | BCOC PEST | 10 | ACETONE | NA |
| 3 | 1620-4 | PEST | 02/04/20 | ACETONE | 06/26/10 |
| 4 | 1667-1 | LOW PEST | 0.2/0.4/2 | ACETONE | 06/26/10 |
| 5 | 1677-1 | EPH | 1500 | MECL2 | 11/12/10 |
| 6 | 1655-3 | PCP | 12.5/125 | ACETONE | 09/24/10 |
| 7 | 1697-2 | ABN | 100 | ACETONE | 01/27/11 |
| 8 | 1681-4 | TBT | 2.5 | MECL2 | 12/01/10 |
| 9 | 1682-2 | PORE TBT | .125/.25 | MECL2 | 12/01/10 |
| 10 | 1698-2 | ABN ACID | 100/200 | MECL2 | 07/14/10 |
| 11 | 1642-2 | TPHD | 15000 | ACETONE | 09/07/10 |
| 12 | 1698-1 | ABN BASE | 200 | MEOH | 07/24/10 |
| 13 | 1613-1 | LOW PCB | 2 | ACETONE | 06/08/10 |
| 14* | 1547-1 | LOW ABN ACID | 10/20 | MEOH | 04/10/10 |
| 15* | 1591-3 | SIM PNA | 15/75 | MEOH | 08/28/10 |
| 16 | 1602-3 | DIOXANE | 100 | MEOH | 03/20/10 |
| 17 | 1644-1 | 1248 PCB | 10 | ACETONE | 09/10/10 |
| 18* | 1591-4 | LOW SIM PNA | 1.5 | ACETONE | 08/28/10 |
| 19 | 1685-3 | AK103 | 7500 | ACETONE | 09/03/10 |
| 20 | 1682-4 | PNA | 100 | ACETONE | 12/04/10 |
| 21 | 1593-3 | SKY/BHT | 100 | MEOH | 03/31/10 |
| 22 | 1675-1 | HERB | 12.5/12500 | MEOH | 02/19/10 |
| 23* | 1505-1 | LW ABN BASE | 20 | MEOH | 03/20/10 |
| 24 | 1696-1 | LOW ABN | 10 | ACETONE | 01/13/11 |
| 25# | 1481-1 | DIPHENYL | 100 | MEOH | NA |
| 26* | 1545-2 | OP-PEST | 25 | MEOH | 02/16/10 |
| 27 | 1668-3 | STEROLS | 200 | MEOH | 10/30/10 |
| 28# | 1684-1 | ADD. PEST | 4 | ACETONE | 03/25/10 |
| 29# | 1496-3 | DECANES | 100 | MEOH | NA |
| 30 | 1620-1 | EDB/DBCP | 0.2 | MEOH | 06/22/10 |

LCS SOLUTIONS

2/2/2010

| | | | | | |
|----|-----------------------------|-------------|--------|---------|----------|
| 31 | 1596-1 | TERPINEOL | 100 | MEOH | 04/03/10 |
| 32 | 1619-3 | GUAIACOL | 50-200 | ACETONE | 04/30/10 |
| 33 | 1639-3 | RETENE | 100 | MEOH | 09/03/10 |
| 34 | 1633-1 | CONGENERS | 2.5 | ACETONE | 08/11/10 |
| 35 | 1674-3 | ALKYL PNA A | 10 | MEOH | 10/28/10 |
| 36 | 1601-3 | ALKYL PNA B | 10 | MEOH | 05/13/10 |
| 50 | 1617-1 | FULL RESIN | 250 | ACETONE | 06/17/10 |
| 51 | 1696-3 | DDTS | 2.5 | ACETONE | 06/03/10 |
| 52 | 1613-5 | 1232 PCB | 20 | ACETONE | 06/16/10 |
| | | | | | |
| | *=REVERIFIED SOLUTION | | | | |
| | #=PROJECT SPECIFIC SOLUTION | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

SURR SOLUTIONS

2/2/2010

| LABEL | SOLN ID | TEST | CONC. UG/ML | SOLVENT | EXP. |
|----------------------|---------|------------|-------------|---------|----------|
| A | 1662-3 | ABN | 100/150 | MEOH | 10/08/10 |
| B | 1633-3 | SIM PNA | 15/75 | MEOH | 08/12/10 |
| C* | 1559-1 | SIM ABN | 25/37.5 | MEOH | 03/13/10 |
| D | 1689-2 | LOW PCB | 0.2 | ACETONE | 12/29/10 |
| E | 1661-2 | HERB | 62.5 | MEOH | 10/02/10 |
| F | 1683-3 | PCP | 12.5 | ACETONE | 12/09/10 |
| G* | 1534-1 | 1,4DIOXANE | 100 | MEOH | 02/20/10 |
| H | 1594-1 | OP-PEST | 25 | MEOH | 04/01/10 |
| I | 1634-1 | LOW S. PNA | 1.5 | MEOH | 08/12/10 |
| J | 1681-2 | TBT-PORE | 0.125 | MECL2 | 12/01/10 |
| K | 1689-1 | MED PCB | 20 | ACETONE | 12/29/10 |
| L | 1681-1 | TBT | 2.5 | MECL2 | 12/01/10 |
| M | 1682-1 | EPH | 1500 | MECL2 | 09/17/10 |
| N | 1689-3 | PCB | 2 | ACETONE | 12/29/10 |
| O | 1699-1 | TPH | 450 | MECL2 | 07/02/10 |
| P | 1666-3 | HCID | 2250 | MECL2 | 05/06/10 |
| Q | 1620-2 | EDB | 1 | MEOH | 06/22/10 |
| R | 1615-1 | RESIN ACID | 250 | ACETONE | 06/17/10 |
| S# | 1568-5 | PBDE | .25 | MEOH | NA |
| T | 1674-2 | ALKYL PNA | 10 | MEOH | 07/30/10 |
| U | 1633-1 | CONGENER | 2.5 | ACETONE | 08/11/10 |
| V | | | | | |
| *reverified solution | | | | | |
| #project specific | | | | | |
| Y | | | | | |
| Z | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |



Spike Recovery Control Limits - Analysis of PCB / Aroclors in Soil & Sediment Samples - EPA SW-846 Method 8082

Effective 5/1/09

Control limits are updated periodically. Assure that you have ARI's current control limits by downloading the files at the time of use. <http://www.arilabs.com/portal/downloads/ARI-CLs.zip>

| | Routine Analysis | PSDDA | Low Level | Low level | Soxhlet Extraction | Medium Level |
|--|---------------------|----------|-----------------|-----------|-----------------------|-----------------|
| Typical Reporting Limit (µg/kg): | 33 | 20 | 10 | 4 | 100 | 800 |
| Nominal Sample Wet Weight (g): | 12 | 25 | 25 | 25 | 10 | 5 |
| Final Extract Volume (mL): | 4 | 5 | 2.5 | 1 | 10 | 40 |
| LCS Spike Recovery ^(1,2) | | | | | | |
| Aroclor 1016 | 48 - 106 | 52 - 101 | 53 - 100 | 37 - 106 | 30 - 160 ³ | 59 - 108 |
| Aroclor 1260 | 50 - 121 | 52 - 126 | 58 - 112 | 50 - 116 | 30 - 160 ³ | 43 - 177 |
| | | | | | | |
| Method Blank / LCS Surrogate Recovery | | | | | | |
| Tetrachloro- <i>meta</i> -xylene (TCMX) | 46 - 111 | 47 - 110 | 43 - 108 | 35 - 100 | 30 - 160 ³ | 49 - 110 |
| Decachlorobiphenyl | 51 - 112 | 48 - 119 | 48 - 118 | 40 - 109 | 30 - 160 ³ | 51 - 127 |
| | | | | | | |
| Sample Surrogate Recovery | | | | | | |
| Tetrachloro- <i>meta</i> -xylene (TCMX) | 50 - 114 | 46 - 113 | 35 - 119 | 38 - 102 | 30 - 160 ³ | 28 - 106 |
| Decachlorobiphenyl | 42 - 127 | 40 - 130 | 33 - 143 | 34 - 141 | 30 - 160 ³ | 22 - 168 |

(1) Laboratory Control Sample (LCS) spike recovery control limits also used as advisory control limits for sample matrix spike (MS) analyses. MS recovery values are advisory and not used to assess the acceptability of an analytical batch.

(2) Highlighted control limits (**bold font**) adjusted to demonstrate that ARI does not use control limits < 10 for the lower limit or < 100 for the upper limit.

(3) 30 – 160 are default, advisory control limits used when there is insufficient data to calculate historic control limits. **DO NOT** use these limits as the sole reason to reject the data from a batch of analyses.



Summary of Laboratory Control Limits

Default limits of 30-160% recovery and 30% RPD apply for all organic analytes when laboratory generated control limits are not available on ARI's web site. Default limits for all inorganic analytes are 75-125% recovery and 25% RPD.

ARI's laboratory generated Quality Control Limits may be superseded by project specific data quality objectives (DQO) provided by ARI's clients. The use of project specific DQO must be approved by ARI's Laboratory and QA Program Managers.



Summary of Laboratory Control Limits Metals Analyses (All Methods & Sample Matrices)

Effective 5/1/09

Control limits are updated periodically. Assure that you have ARI's current control limits by downloading the files at the time of use. <http://www.arilabs.com/portal/downloads/ARI-CLs.zip>

| Element | Matrix Spike Recovery | LCS Recovery | Replicate RPD |
|-----------|-----------------------|--------------|---------------|
| Aluminum | 75 - 125 | 80 - 120 | ≤ 20% |
| Antimony | 75 - 125 | 80 - 120 | ≤ 20% |
| Arsenic | 75 - 125 | 80 - 120 | ≤ 20% |
| Barium | 75 - 125 | 80 - 120 | ≤ 20% |
| Beryllium | 75 - 125 | 80 - 120 | ≤ 20% |
| Boron | 75 - 125 | 80 - 120 | ≤ 20% |
| Cadmium | 75 - 125 | 80 - 120 | ≤ 20% |
| Calcium | 75 - 125 | 80 - 120 | ≤ 20% |
| Chromium | 75 - 125 | 80 - 120 | ≤ 20% |
| Cobalt | 75 - 125 | 80 - 120 | ≤ 20% |
| Copper | 75 - 125 | 80 - 120 | ≤ 20% |
| Iron | 75 - 125 | 80 - 120 | ≤ 20% |
| Lead | 75 - 125 | 80 - 120 | ≤ 20% |
| Magnesium | 75 - 125 | 80 - 120 | ≤ 20% |
| Manganese | 75 - 125 | 80 - 120 | ≤ 20% |
| Mercury | 75 - 125 | 80 - 120 | ≤ 20% |
| Nickel | 75 - 125 | 80 - 120 | ≤ 20% |
| Potassium | 75 - 125 | 80 - 120 | ≤ 20% |
| Selenium | 75 - 125 | 80 - 120 | ≤ 20% |
| Silica | 75 - 125 | 80 - 120 | ≤ 20% |
| Silver | 75 - 125 | 80 - 120 | ≤ 20% |
| Sodium | 75 - 125 | 80 - 120 | ≤ 20% |
| Strontium | 75 - 125 | 80 - 120 | ≤ 20% |
| Thallium | 75 - 125 | 80 - 120 | ≤ 20% |
| Vanadium | 75 - 125 | 80 - 120 | ≤ 20% |
| Zinc | 75 - 125 | 80 - 120 | ≤ 20% |



| Spike Recovery Control Limits for Conventional Wet Chemistry | | |
|---|----------------------|-----------------|
| Effective 5/1/09 | | |
| Control limits are updated periodically. Assure that you have ARI's current control limits by downloading the files at the time of use. http://www.arilabs.com/portal/downloads/ARI-CLs.zip | | |
| | ARI's Control Limits | |
| Sample Matrix: | Water | Soil / Sediment |
| <i>Matrix Spike Recoveries</i> | % Recovery | % Recovery |
| Ammonia | 75 - 125 | 75 - 125 |
| Bromide | 75 - 125 | 75 - 125 |
| Chloride | 75 - 125 | 75 - 125 |
| Cyanide | 75 - 125 | 75 - 125 |
| Ferrous Iron | 75 - 125 | 75 - 125 |
| Fluoride | 75 - 125 | 75 - 125 |
| Formaldehyde | 75 - 125 | 75 - 125 |
| Hexane Extractable Material | -- - -- | 78 - 114 |
| Hexavalent Chromium | 75 - 125 | 75 - 125 |
| Nitrate/Nitrite | 75 - 125 | 75 - 125 |
| Oil and Grease | 75 - 125 | 75 - 125 |
| Phenol | 75 - 125 | 75 - 125 |
| Phosphorous | 75 - 125 | 75 - 125 |
| Sulfate | 75 - 125 | 75 - 125 |
| Sulfide | 75 - 125 | 75 - 125 |
| Total Kjeldahl Nitrogen | 75 - 125 | 75 - 125 |
| Total Organic Carbon | 75 - 125 | 75 - 125 |
| <i>Duplicate RPDs</i> | | |
| Acidity | ±20% | ±20% |
| Alkalinity | ±20% | ±20% |
| BOD | ±20% | ±20% |
| Cation Exchange | ±20% | ±20% |
| COD | ±20% | ±20% |
| Conductivity | ±20% | ±20% |
| Salinity | ±20% | ±20% |
| Solids | ±20% | ±20% |
| Turbidity | ±20% | ±20% |

Data Summary Package

prepared
for

The Boeing Company

Project: PL2 Source Control

ARI JOB NO: QI23, QI24, QI75, QI78, QI90

prepared
by

Analytical Resources, Inc.



ARI Job No.: QI 75

Client ID: The Boeing Company

Parameter: PCB

Client Project: Source Control

SOP Number(s):

No Anomalies:

List problems, concerns, corrective actions and any other pertinent information

Prep time (Prior to drying) 1 hour Prep Time (After drying) 5mins

Wet Weight, B = 565.44g

Metals Solids Split, B = 19.87g

Dry Weight with Plastic Ring - B = 146.67g

Plastic Ring Weight - B = 8.49g

Dry Weight without Plastic Ring - B = 138.18g WC 211414

GC analyst, Sample was surrogate at 5X normal level to leave room for possible dilutions. ~~SA~~ 2/14/10

SAMPLE TAKEN TO 10m FEV WITH 5m SPLIT FOR CLEANUPS.

2m TAKEN FOR SPE WHICH WILL BE BLOWN DOWN TO 1m

AFTER SPE FOR 1:5 FINAL SPLIT.

W 02/12/10


HIGH ~~VOLUME~~ ^{W 02/12/10} VOLUME ACID CLEANUPS. W 02/12/10

Analyst Initials:

Date:

PCB ANALYSIS

Sample ID: PL2SC-SS-I-020510
SAMPLE

Lab Sample ID: QI75B
LIMS ID: 10-3242
Matrix: Filter Bag
Data Release Authorized: 
Reported: 02/16/10

QC Report No: QI75-The Boeing Company
Project: Source Control

Date Sampled: 02/05/10
Date Received: 02/05/10

Date Extracted: 02/10/10
Date Analyzed: 02/12/10 18:43
Instrument/Analyst: ECD5/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes

Sample Amount: 1.00 Filter Bag
Final Extract Volume: 5.0 mL
Dilution Factor: 100
Silica Gel: Yes

| CAS Number | Analyte | RL | Result |
|------------|--------------|----|--------|
| 12674-11-2 | Aroclor 1016 | 10 | < 10 U |
| 53469-21-9 | Aroclor 1242 | 10 | < 10 U |
| 12672-29-6 | Aroclor 1248 | 10 | < 10 U |
| 11097-69-1 | Aroclor 1254 | 40 | < 40 Y |
| 11096-82-5 | Aroclor 1260 | 10 | 76 |
| 11104-28-2 | Aroclor 1221 | 10 | < 10 U |
| 11141-16-5 | Aroclor 1232 | 10 | < 10 U |

Reported in Total μ g

PCB Surrogate Recovery

| | |
|-----------------------|---|
| Decachlorobiphenyl | D |
| Tetrachlorometaxylene | D |

SW8082/PCB SURROGATE RECOVERY SUMMARY

Matrix: Filter Bag

QC Report No: QI75-The Boeing Company
Project: Source Control


| Client ID | DCBP | TCMX | TOT OUT |
|-------------------|-------|-------|---------|
| MB-021010 | 64.2% | 57.2% | 0 |
| LCS-021010 | 60.2% | 59.0% | 0 |
| LCSD-021010 | 58.8% | 58.0% | 0 |
| PL2SC-SS-I-020510 | D | D | 0 |

| | LCS/MB LIMITS | QC LIMITS |
|--------------------------------|---------------|-----------|
| (DCBP) = Decachlorobiphenyl | (30-160) | (30-160) |
| (TCMX) = Tetrachlorometaxylene | (30-160) | (30-160) |

Prep Method: SW3580A
Log Number Range: 10-3242 to 10-3242

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082
Page 1 of 1

Sample ID: LCS-021010
LCS/LCSD

Lab Sample ID: LCS-021010
LIMS ID: 10-3242
Matrix: Filter Bag
Data Release Authorized: 
Reported: 02/16/10

QC Report No: QI75-The Boeing Company
Project: Source Control

Date Sampled: 02/05/10
Date Received: 02/05/10

Date Extracted LCS/LCSD: 02/10/10

Sample Amount LCS: 1.00 Filter Bag
LCSD: 1.00 Filter Bag

Date Analyzed LCS: 02/12/10 17:17
LCSD: 02/12/10 17:39

Final Extract Volume LCS: 5.0 mL
LCSD: 5.0 mL

Instrument/Analyst LCS: ECD5/JGR
LCSD: ECD5/JGR

Dilution Factor LCS: 1.00
LCSD: 1.00

GPC Cleanup: No
Sulfur Cleanup: Yes

Silica Gel: Yes
Acid Cleanup: Yes

| Analyte | Spike | | LCS Recovery | Spike | | LCSD Recovery | RPD |
|--------------|-------|-----------|-----------------|-------|------------|------------------|------|
| | LCS | Added-LCS | | LCSD | Added-LCSD | | |
| Aroclor 1016 | 2.1 | 2.5 | 84.0% | 2.1 | 2.5 | 84.0% | 0.0% |
| Aroclor 1260 | 1.6 | 2.5 | 64.0% | 1.6 | 2.5 | 64.0% | 0.0% |


PCB Surrogate Recovery

| | LCS | LCSD |
|-----------------------|-------|-------|
| Decachlorobiphenyl | 60.2% | 58.8% |
| Tetrachlorometaxylene | 59.0% | 58.0% |

Reported in Total μ g
RPD calculated using sample concentrations per SW846.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082
Page 1 of 1

Sample ID: MB-021010
METHOD BLANK

Lab Sample ID: MB-021010
LIMS ID: 10-3242
Matrix: Filter Bag
Data Release Authorized: 
Reported: 02/16/10

QC Report No: QI75-The Boeing Company
Project: Source Control

Date Sampled: NA
Date Received: NA

Date Extracted: 02/10/10
Date Analyzed: 02/12/10 16:56
Instrument/Analyst: ECD5/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes

Sample Amount: 1.00 Filter Bag
Final Extract Volume: 5.0 mL
Dilution Factor: 1.00
Silica Gel: Yes

| CAS Number | Analyte | RL | Result |
|------------|--------------|-----|---------|
| 12674-11-2 | Aroclor 1016 | 0.1 | < 0.1 U |
| 53469-21-9 | Aroclor 1242 | 0.1 | < 0.1 U |
| 12672-29-6 | Aroclor 1248 | 0.1 | < 0.1 U |
| 11097-69-1 | Aroclor 1254 | 0.1 | < 0.1 U |
| 11096-82-5 | Aroclor 1260 | 0.1 | < 0.1 U |
| 11104-28-2 | Aroclor 1221 | 0.1 | < 0.1 U |
| 11141-16-5 | Aroclor 1232 | 0.1 | < 0.1 U |

Reported in Total μ g

PCB Surrogate Recovery

| | |
|-----------------------|-------|
| Decachlorobiphenyl | 64.2% |
| Tetrachlorometaxylene | 57.2% |

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082
Page 1 of 1

Sample ID: PL2SC-EB3-020510
SAMPLE

Lab Sample ID: QI78A
LIMS ID: 10-3259

QC Report No: QI78-The Boeing Company
Project: PL2 Source Control

Matrix: Water

Data Release Authorized: *B*

Date Sampled: 02/05/10

Reported: 02/12/10

Date Received: 02/05/10

Date Extracted: 02/10/10

Sample Amount: 500 mL

Date Analyzed: 02/11/10 15:59

Final Extract Volume: 5.0 mL

Instrument/Analyst: ECD5/JGR

Dilution Factor: 1.00

GPC Cleanup: No

Silica Gel: No

Sulfur Cleanup: No

Acid Cleanup: Yes

| CAS Number | Analyte | RL | Result |
|------------|--------------|------|----------|
| 12674-11-2 | Aroclor 1016 | 0.20 | < 0.20 U |
| 53469-21-9 | Aroclor 1242 | 0.20 | < 0.20 U |
| 12672-29-6 | Aroclor 1248 | 0.20 | < 0.20 U |
| 11097-69-1 | Aroclor 1254 | 0.20 | < 0.20 U |
| 11096-82-5 | Aroclor 1260 | 0.20 | < 0.20 U |
| 11104-28-2 | Aroclor 1221 | 0.20 | < 0.20 U |
| 11141-16-5 | Aroclor 1232 | 0.20 | < 0.20 U |

Reported in $\mu\text{g/L}$ (ppb)

PCB Surrogate Recovery

| | |
|-----------------------|-------|
| Decachlorobiphenyl | 43.8% |
| Tetrachlorometaxylene | 63.2% |

SW8082/PCB WATER SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: QI78-The Boeing Company
Project: PL2 Source Control

| Client ID | DCBP % REC | DCBP LCL-UCL | TCMX % REC | TCMX LCL-UCL | TOT OUT |
|------------------|---------------|-----------------|---------------|-----------------|---------|
| MB-021010 | 56.0% | 41-111 | 62.8% | 40-118 | 0 |
| LCS-021010 | 57.5% | 41-111 | 65.0% | 40-118 | 0 |
| LCSD-021010 | 59.2% | 41-111 | 66.8% | 40-118 | 0 |
| PL2SC-EB3-020510 | 43.8% | 29-118 | 63.2% | 38-118 | 0 |

Prep Method: SW3510C
Log Number Range: 10-3259 to 10-3259

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082
Page 1 of 1

Sample ID: LCS-021010
LCS/LCSD

Lab Sample ID: LCS-021010
LIMS ID: 10-3259
Matrix: Water
Data Release Authorized: *[Signature]*
Reported: 02/12/10

QC Report No: QI78-The Boeing Company
Project: PL2 Source Control

Date Sampled: NA
Date Received: NA

Date Extracted LCS/LCSD: 02/10/10

Sample Amount LCS: 500 mL
LCSD: 500 mL

Date Analyzed LCS: 02/11/10 15:16
LCSD: 02/11/10 15:37

Final Extract Volume LCS: 5.0 mL
LCSD: 5.0 mL

Instrument/Analyst LCS: ECD5/JGR
LCSD: ECD5/JGR

Dilution Factor LCS: 1.00
LCSD: 1.00

GPC Cleanup: No
Sulfur Cleanup: No

Silica Gel: No
Acid Cleanup: Yes

| Analyte | LCS | Spike Added-LCS | LCS Recovery | LCSD | Spike Added-LCSD | LCSD Recovery | RPD |
|--------------|------|--------------------|-----------------|------|---------------------|------------------|------|
| Aroclor 1016 | 4.80 | 5.00 | 96.0% | 5.01 | 5.00 | 100% | 4.3% |
| Aroclor 1260 | 3.41 | 5.00 | 68.2% | 3.50 | 5.00 | 70.0% | 2.6% |

PCB Surrogate Recovery

| | LCS | LCSD |
|-----------------------|-------|-------|
| Decachlorobiphenyl | 57.5% | 59.2% |
| Tetrachlorometaxylene | 65.0% | 66.8% |

Results reported in $\mu\text{g/L}$
RPD calculated using sample concentrations per SW846.

ORGANICS ANALYSIS DATA SHEET

PCB by GC/ECD Method SW8082

Page 1 of 1

Sample ID: MB-021010

METHOD BLANK

Lab Sample ID: MB-021010

LIMS ID: 10-3259

Matrix: Water

Data Release Authorized: *JS*

Reported: 02/12/10

QC Report No: QI78-The Boeing Company

Project: PL2 Source Control

Date Sampled: NA

Date Received: NA

Date Extracted: 02/10/10

Date Analyzed: 02/11/10 14:55

Instrument/Analyst: ECD5/JGR

GPC Cleanup: No

Sulfur Cleanup: No

Sample Amount: 500 mL

Final Extract Volume: 5.0 mL

Dilution Factor: 1.00

Silica Gel: No

Acid Cleanup: Yes

| CAS Number | Analyte | RL | Result |
|------------|--------------|------|----------|
| 12674-11-2 | Aroclor 1016 | 0.20 | < 0.20 U |
| 53469-21-9 | Aroclor 1242 | 0.20 | < 0.20 U |
| 12672-29-6 | Aroclor 1248 | 0.20 | < 0.20 U |
| 11097-69-1 | Aroclor 1254 | 0.20 | < 0.20 U |
| 11096-82-5 | Aroclor 1260 | 0.20 | < 0.20 U |
| 11104-28-2 | Aroclor 1221 | 0.20 | < 0.20 U |
| 11141-16-5 | Aroclor 1232 | 0.20 | < 0.20 U |

Reported in $\mu\text{g/L}$ (ppb)


PCB Surrogate Recovery

| | |
|-----------------------|-------|
| Decachlorobiphenyl | 56.0% |
| Tetrachlorometaxylene | 62.8% |

METALS ANALYSIS

INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS
Page 1 of 1

Sample ID: PL2SC-W-J505A-020310
SAMPLE

Lab Sample ID: QI23A
LIMS ID: 10-2712
Matrix: Water
Data Release Authorized: 
Reported: 03/01/10

QC Report No: QI23-The Boeing Company
Project: BP2 Source Control

Date Sampled: 02/03/10
Date Received: 02/03/10

| Prep Meth | Prep Date | Analysis Method | Analysis Date | CAS Number | Analyte | RL | µg/L | Q |
|--------------|--------------|--------------------|------------------|------------|----------|-----|------|---|
| 200.8 | 02/05/10 | 200.8 | 02/15/10 | 7440-38-2 | Arsenic | 0.2 | 0.3 | |
| 6010B | 02/05/10 | 6010B | 02/23/10 | 7440-43-9 | Cadmium | 2 | 2 | U |
| 6010B | 02/05/10 | 6010B | 02/23/10 | 7440-47-3 | Chromium | 5 | 5 | U |
| 6010B | 02/05/10 | 6010B | 02/23/10 | 7440-50-8 | Copper | 2 | 9 | |
| 200.8 | 02/05/10 | 200.8 | 02/15/10 | 7439-92-1 | Lead | 1 | 1 | U |
| 6010B | 02/05/10 | 6010B | 02/23/10 | 7440-22-4 | Silver | 3 | 3 | U |
| 6010B | 02/05/10 | 6010B | 02/23/10 | 7440-66-6 | Zinc | 10 | 60 | |

U-Analyte undetected at given RL
RL-Reporting Limit

INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS


Page 1 of 1

Sample ID: LAB CONTROL

Lab Sample ID: QI23LCS

LIMS ID: 10-2712

Matrix: Water

Data Release Authorized: 

Reported: 03/01/10

QC Report No: QI23-The Boeing Company

Project: BP2 Source Control

Date Sampled: NA

Date Received: NA

BLANK SPIKE QUALITY CONTROL REPORT

| Analyte | Analysis Method | Spike Found | Spike Added | % Recovery | Q |
|----------|-----------------|-------------|-------------|------------|---|
| Arsenic | 200.8 | 26.7 | 25.0 | 107% | |
| Cadmium | 6010B | 524 | 500 | 105% | |
| Chromium | 6010B | 508 | 500 | 102% | |
| Copper | 6010B | 503 | 500 | 101% | |
| Lead | 200.8 | 26 | 25 | 104% | |
| Silver | 6010B | 491 | 500 | 98.2% | |
| Zinc | 6010B | 510 | 500 | 102% | |

Reported in µg/L

N-Control limit not met

Control Limits: 80-120%

INORGANICS ANALYSIS DATA SHEET

DISSOLVED METALS


Page 1 of 1

Sample ID: METHOD BLANK

Lab Sample ID: QI23MB

LIMS ID: 10-2712

Matrix: Water

Data Release Authorized: 

Reported: 03/01/10

QC Report No: QI23-The Boeing Company

Project: BP2 Source Control

Date Sampled: NA

Date Received: NA

| Prep Meth | Prep Date | Analysis Method | Analysis Date | CAS Number | Analyte | RL | µg/L | Q |
|--------------|--------------|--------------------|------------------|------------|----------|-----|------|---|
| 200.8 | 02/05/10 | 200.8 | 02/15/10 | 7440-38-2 | Arsenic | 0.2 | 0.2 | U |
| 6010B | 02/05/10 | 6010B | 02/23/10 | 7440-43-9 | Cadmium | 2 | 2 | U |
| 6010B | 02/05/10 | 6010B | 02/23/10 | 7440-47-3 | Chromium | 5 | 5 | U |
| 6010B | 02/05/10 | 6010B | 02/23/10 | 7440-50-8 | Copper | 2 | 2 | U |
| 200.8 | 02/05/10 | 200.8 | 02/15/10 | 7439-92-1 | Lead | 1 | 1 | U |
| 6010B | 02/05/10 | 6010B | 02/23/10 | 7440-22-4 | Silver | 3 | 3 | U |
| 6010B | 02/05/10 | 6010B | 02/23/10 | 7440-66-6 | Zinc | 10 | 10 | U |

U-Analyte undetected at given RL
RL-Reporting Limit

INORGANICS ANALYSIS DATA SHEET

TOTAL METALS

Page 1 of 1


Sample ID: PL2SC-SS-I-020510

SAMPLE

Lab Sample ID: QI75A

LIMS ID: 10-3241

Matrix: Soil

Data Release Authorized: 

Reported: 03/01/10

QC Report No: QI75-The Boeing Company

Project: Source Control

Date Sampled: 02/05/10

Date Received: 02/05/10

Percent Total Solids: 21.2%

| Prep Meth | Prep Date | Analysis Method | Analysis Date | CAS Number | Analyte | RL | mg/kg-dry | Q |
|-----------|-----------|-----------------|---------------|------------|----------|------|-----------|---|
| 3050B | 02/09/10 | 200.8 | 02/15/10 | 7440-38-2 | Arsenic | 0.9 | 28.3 | |
| 3050B | 02/09/10 | 6010B | 02/23/10 | 7440-43-9 | Cadmium | 0.9 | 4.6 | |
| 3050B | 02/09/10 | 6010B | 02/23/10 | 7440-47-3 | Chromium | 2 | 336 | |
| 3050B | 02/09/10 | 6010B | 02/23/10 | 7440-50-8 | Copper | 0.9 | 235 | |
| 3050B | 02/09/10 | 200.8 | 02/15/10 | 7439-92-1 | Lead | 5 | 229 | |
| CLP | 02/09/10 | 7471A | 02/10/10 | 7439-97-6 | Mercury | 0.09 | 0.40 | |
| 3050B | 02/09/10 | 6010B | 02/23/10 | 7440-22-4 | Silver | 1 | 1 | U |
| 3050B | 02/09/10 | 6010B | 02/23/10 | 7440-66-6 | Zinc | 5 | 1,430 | |

U-Analyte undetected at given RL

RL-Reporting Limit

INORGANICS ANALYSIS DATA SHEET

TOTAL METALS

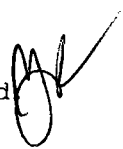
Page 1 of 1

Sample ID: LAB CONTROL

Lab Sample ID: QI75LCS

LIMS ID: 10-3241

Matrix: Soil

Data Release Authorized 

Reported: 03/01/10

QC Report No: QI75-The Boeing Company

Project: Source Control

Date Sampled: NA

Date Received: NA

BLANK SPIKE QUALITY CONTROL REPORT

| Analyte | Analysis Method | Spike Found | Spike Added | % Recovery | Q |
|----------|-----------------|-------------|-------------|------------|---|
| Arsenic | 200.8 | 27.2 | 25.0 | 109% | |
| Cadmium | 6010B | 51.5 | 50.0 | 103% | |
| Chromium | 6010B | 52.6 | 50.0 | 105% | |
| Copper | 6010B | 53.8 | 50.0 | 108% | |
| Lead | 200.8 | 27 | 25 | 108% | |
| Mercury | 7471A | 0.51 | 0.50 | 102% | |
| Silver | 6010B | 50.9 | 50.0 | 102% | |
| Zinc | 6010B | 54 | 50 | 108% | |

Reported in mg/kg-dry

N-Control limit not met

NA-Not Applicable, Analyte Not Spiked

Control Limits: 80-120%

INORGANICS ANALYSIS DATA SHEET

TOTAL METALS


Page 1 of 1

Sample ID: METHOD BLANK

Lab Sample ID: QI75MB

LIMS ID: 10-3241

Matrix: Soil

Data Release Authorized: 

Reported: 03/01/10

QC Report No: QI75-The Boeing Company

Project: Source Control

Date Sampled: NA

Date Received: NA

Percent Total Solids: NA


| Prep Meth | Prep Date | Analysis Method | Analysis Date | CAS Number | Analyte | RL | mg/kg-dry | Q |
|--------------|--------------|--------------------|------------------|------------------|---------------|------|------------|---|
| 3050B | 02/09/10 | 200.8 | 02/15/10 | 7440-38-2 | Arsenic | 0.2 | 0.2 | U |
| 3050B | 02/09/10 | 6010B | 02/23/10 | 7440-43-9 | Cadmium | 0.2 | 0.2 | U |
| 3050B | 02/09/10 | 6010B | 02/23/10 | 7440-47-3 | Chromium | 0.5 | 0.5 | U |
| 3050B | 02/09/10 | 6010B | 02/23/10 | 7440-50-8 | Copper | 0.2 | 0.2 | |
| 3050B | 02/09/10 | 200.8 | 02/15/10 | 7439-92-1 | Lead | 1 | 1 | U |
| CLP | 02/09/10 | 7471A | 02/10/10 | 7439-97-6 | Mercury | 0.02 | 0.02 | U |
| 3050B | 02/09/10 | 6010B | 02/23/10 | 7440-22-4 | Silver | 0.3 | 0.3 | U |
| 3050B | 02/09/10 | 6010B | 02/23/10 | 7440-66-6 | Zinc | 1 | 2 | |

U-Analyte undetected at given RL

RL-Reporting Limit

INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS
Page 1 of 1

Sample ID: PL2SC-EB3-020510
SAMPLE

Lab Sample ID: QI78A
LIMS ID: 10-3259
Matrix: Water
Data Release Authorized: 
Reported: 03/01/10

QC Report No: QI78-The Boeing Company
Project: PL2 Source Control


Date Sampled: 02/05/10
Date Received: 02/05/10

| Prep Meth | Prep Date | Analysis Method | Analysis Date | CAS Number | Analyte | RL | µg/L | Q |
|-----------|-----------|-----------------|---------------|------------|----------|-----|------|---|
| 200.8 | 02/10/10 | 200.8 | 02/15/10 | 7440-38-2 | Arsenic | 0.2 | 0.2 | U |
| 6010B | 02/10/10 | 6010B | 02/23/10 | 7440-43-9 | Cadmium | 2 | 2 | U |
| 6010B | 02/10/10 | 6010B | 02/23/10 | 7440-47-3 | Chromium | 5 | 5 | U |
| 6010B | 02/10/10 | 6010B | 02/23/10 | 7440-50-8 | Copper | 2 | 2 | U |
| 200.8 | 02/10/10 | 200.8 | 02/15/10 | 7439-92-1 | Lead | 1 | 1 | U |
| 6010B | 02/10/10 | 6010B | 02/23/10 | 7440-22-4 | Silver | 3 | 3 | U |
| 6010B | 02/10/10 | 6010B | 02/23/10 | 7440-66-6 | Zinc | 10 | 10 | U |

U-Analyte undetected at given RL
RL-Reporting Limit

INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS
Page 1 of 1

Sample ID: LAB CONTROL

Lab Sample ID: QI78LCS
LIMS ID: 10-3259
Matrix: Water
Data Release Authorized: 
Reported: 03/01/10

QC Report No: QI78-The Boeing Company
Project: PL2 Source Control

Date Sampled: NA
Date Received: NA

BLANK SPIKE QUALITY CONTROL REPORT

| Analyte | Analysis Method | Spike Found | Spike Added | % Recovery | Q |
|----------|-----------------|-------------|-------------|------------|---|
| Arsenic | 200.8 | 27.7 | 25.0 | 111% | |
| Cadmium | 6010B | 520 | 500 | 104% | |
| Chromium | 6010B | 510 | 500 | 102% | |
| Copper | 6010B | 501 | 500 | 100% | |
| Lead | 200.8 | 27 | 25 | 108% | |
| Silver | 6010B | 485 | 500 | 97.0% | |
| Zinc | 6010B | 510 | 500 | 102% | |

Reported in µg/L

N-Control limit not met
Control Limits: 80-120%


INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS
Page 1 of 1

Sample ID: METHOD BLANK

Lab Sample ID: QI78MB

LIMS ID: 10-3259

Matrix: Water

Data Release Authorized: 

Reported: 03/01/10

QC Report No: QI78-The Boeing Company

Project: PL2 Source Control

Date Sampled: NA

Date Received: NA

| Prep Meth | Prep Date | Analysis Method | Analysis Date | CAS Number | Analyte | RL | µg/L | Q |
|--------------|--------------|--------------------|------------------|------------|----------|-----|------|---|
| 200.8 | 02/10/10 | 200.8 | 02/15/10 | 7440-38-2 | Arsenic | 0.2 | 0.2 | U |
| 6010B | 02/10/10 | 6010B | 02/23/10 | 7440-43-9 | Cadmium | 2 | 2 | U |
| 6010B | 02/10/10 | 6010B | 02/23/10 | 7440-47-3 | Chromium | 5 | 5 | U |
| 6010B | 02/10/10 | 6010B | 02/23/10 | 7440-50-8 | Copper | 2 | 2 | U |
| 200.8 | 02/10/10 | 200.8 | 02/15/10 | 7439-92-1 | Lead | 1 | 1 | U |
| 6010B | 02/10/10 | 6010B | 02/23/10 | 7440-22-4 | Silver | 3 | 3 | U |
| 6010B | 02/10/10 | 6010B | 02/23/10 | 7440-66-6 | Zinc | 10 | 10 | U |

U-Analyte undetected at given RL
RL-Reporting Limit

MERCURY ANALYSIS

INORGANICS ANALYSIS DATA SHEET
Dissolved Mercury by Method SW7470A



Data Release Authorized
Reported: 02/12/10
Date Received: 02/03/10
Page 1 of 1

QC Report No: QI24-The Boeing Company
Project: BP2 Source Control


| Client/ ARI ID | Date Sampled | Matrix | Prep Date Anal Date | RL | Result |
|---------------------------------------|-----------------|-------------|------------------------|------|--------|
| PL2SC-W-J505A-020310 QI24A 10-2713 | 02/03/10 | Groundwater | 02/09/10 02/11/10 | 20.0 | 20.0 U |
| MB-020910 Method Blank | NA | Groundwater | 02/09/10 02/11/10 | 20.0 | 20.0 U |

Reported in ng/L

RL-Analytical reporting limit
U-Undetected at reported detection limit

INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS
Page 1 of 1

Sample ID: LAB CONTROL

Lab Sample ID: QI24LCS
LIMS ID: 10-2713
Matrix: Groundwater
Data Release Authorized: 
Reported: 02/12/10

QC Report No: QI24-The Boeing Company
Project: BP2 Source Control
Date Sampled: NA
Date Received: NA

BLANK SPIKE QUALITY CONTROL REPORT


| Analyte | Analysis Method | Spike Found | Spike Added | % Recovery | Q |
|---------|-----------------|-------------|-------------|------------|---|
| Mercury | 7470A | 206 | 200 | 103% | |

Reported in ng/L

N-Control limit not met
Control Limits: 80-120%

INORGANICS ANALYSIS DATA SHEET
Dissolved Mercury by Method SW7470A



Data Release Authorized: 
Reported: 02/12/10
Date Received: 02/05/10
Page 1 of 1

QC Report No: QI90-The Boeing Company
Project: PL2 Source Control


| Client/ ARI ID | Date Sampled | Matrix | Prep Date Anal Date | RL | Result |
|-------------------|-----------------|--------|------------------------|------|--------|
| PL2SC-EB3-020510 | 02/05/10 | Water | 02/10/10 | 20.0 | 20.0 U |
| QI90A 10-3260 | | | 02/11/10 | | |
| MB-021010 | NA | Water | 02/10/10 | 20.0 | 20.0 U |
| Method Blank | | | 02/11/10 | | |

Reported in ng/L

RL-Analytical reporting limit
U-Undetected at reported detection limit

INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS
Page 1 of 1

Sample ID: LAB CONTROL

Lab Sample ID: QI90LCS
LIMS ID: 10-3260
Matrix: Water
Data Release Authorized: 
Reported: 02/12/10

QC Report No: QI90-The Boeing Company
Project: PL2 Source Control

Date Sampled: NA
Date Received: NA

BLANK SPIKE QUALITY CONTROL REPORT

| Analyte | Analysis Method | Spike Found | Spike Added | % Recovery | Q |
|---------|-----------------|-------------|-------------|------------|---|
| Mercury | 7470A | 208 | 200 | 104% | |


Reported in ng/L

N-Control limit not met
Control Limits: 80-120%

GENERAL CHEMISTRY ANALYSIS

SAMPLE RESULTS-CONVENTIONALS
QI23-The Boeing Company



Matrix: Water
Data Release Authorized: 
Reported: 02/04/10

Project: BP2 Source Control
Event: NA
Date Sampled: 02/03/10
Date Received: 02/03/10


Client ID: PL2SC-W-J505A-020310
ARI ID: 10-2712 QI23A

| Analyte | Date Batch | Method | Units | RL | Sample |
|----------------|-----------------------|---------------|--------------|-----------|---------------|
| pH | 02/03/10 020310#1 | EPA 150.1 | std units | 0.01 | 6.93 |

RL Analytical reporting limit
U Undetected at reported detection limit

REPLICATE RESULTS-CONVENTIONALS
QI23-The Boeing Company



Matrix: Water
Data Release Authorized: 
Reported: 02/04/10

Project: BP2 Source Control
Event: NA
Date Sampled: 02/03/10
Date Received: 02/03/10

| Analyte | Method | Date | Units | Sample | Replicate(s) | RPD/RSD |
|---|-----------|----------|-----------|--------|--------------|---------|
| ARI ID: QI23A Client ID: PL2SC-W-J505A-020310 | | | | | | |
| pH | EPA 150.1 | 02/03/10 | std units | 6.93 | 6.93 | 0.00 |

pH is evaluated as the Absolute Difference between the values rather than
Relative Percent Difference

LAB CONTROL RESULTS-CONVENTIONALS
QI23-The Boeing Company



Matrix: Water
Data Release Authorized:
Reported: 02/04/10

A handwritten signature in black ink, appearing to be 'J. D.' or similar, written over the 'Data Release Authorized:' line.

Project: BP2 Source Control
Event: NA
Date Sampled: NA
Date Received: NA

| Analyte/Method | QC ID | Date | Units | LCS | Spike Added | Recovery |
|-----------------|-------|----------|-----------|------|-------------|----------|
| pH EPA 150.1 | ICVL | 02/03/10 | std units | 7.01 | 7.00 | 0.01 |

pH is evaluated as the Absolute Difference between the values rather than Percent Recovery.

TOTAL SOLIDS

Solids Data Entry Report
Date: 02/10/10

Checked by: DM
Data Analyst: KM

Date: 2/10/10

Solids Determination performed on 02/09/10 by MH

| JOB | SAMPLE | CLIENTID | TAREWEIGHT | SAMPDISH | DRYWEIGHT | SOLIDS |
|------|--------|-------------------|------------|----------|-----------|--------|
| QI75 | A | PL2SC-SS-I-020510 | 0.973 | 10.340 | 2.960 | 21.21 |

Q123:00056



Analytical Resources, Incorporated
Analytical Chemists and Consultants

March 23, 2010

Kent Angelos
Golder Associates, Inc.
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

RE: Boeing Plant 2 Source Control
ARI IDs: QJ96 & QJ98

Dear Kent:

Please find enclosed the original Chain of Custody (COC) records, sample receipt documentation, and the final data package for the project referenced above.

Sample receipt information and analytical details are addressed in the Case Narrative.

An electronic copy of this package will be kept on file at ARI. If you have any questions or require additional information, please contact me at your convenience.

Sincerely,
ANALYTICAL RESOURCES, INC.

Cheronne Oreiro
Project Manager
-For-
Kelly Bottem
Client Services Manager
(206) 695-6211
kellyb@arilabs.com

cc: Kent Angelos, Golder Associates Inc., 18300 NE Union Hill Road, Suite 200,
Redmond, WA 98052-3333

Chain of Custody
Documentation

prepared
for

The Boeing Company

Project: BP2 Source Control

ARI JOB NO: QJ96, QJ98

prepared
by

Analytical Resources, Inc.

| | |
|-------------------|-------------------------|
| Page: 1 | of 1 |
| Date: 2/12/2010 | Ice Present? <i>yes</i> |
| No. of Coolers: 1 | Cooler Temps: 6.6 |

| | | | |
|----------------------|------------|------------------------|-----|
| ARI Assigned Number: | 2546 | Turn-around Requested: | 57d |
| ARI Client Company: | Boeing | | |
| Client Contact: | Will FENST | | |
| | Phone: | | |

Analytical Resources, Incorporated
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)

| Client Project Name: BPA Source Control | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| Sample ID | Date | Time | Matrix | No. Containers | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| P-2SC-W-B-02-1210 BASE | 02/12/10 | 17:05 | w | 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Limits of Liability: ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-located agreement between ARI and the Client.

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.



Cooler Receipt Form

ARI Client: Baering
COC No(s): NA
Assigned ARI Job No: QJ96

Project Name: BP2 Source Control
Delivered by: Fed-Ex UPS Courier Hand Delivered Other: NA
Tracking No: NA

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to cooler? YES NO
Were custody papers included with the cooler? YES NO
Were custody papers properly filled out (ink, signed, etc.) YES NO
Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry) 6.6
If cooler temperature is out of compliance fill out form 00070F Temp Gun ID#: 90941619
Cooler Accepted by: JP Date: 2/12/10 Time: 1744
Complete custody forms and attach all shipping documents

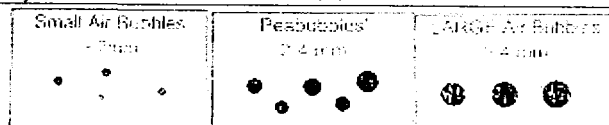
Log-In Phase:

Was a temperature blank included in the cooler? YES NO
What kind of packing material was used? ... Bubble Wrap Wet Ice Gel Packs Baggies Foam Block Paper Other: NA
Was sufficient ice used (if appropriate)? NA YES NO
Were all bottles sealed in individual plastic bags? YES NO
Did all bottles arrive in good condition (unbroken)? YES NO
Were all bottle labels complete and legible? YES NO
Did the number of containers listed on COC match with the number of containers received? YES NO
Did all bottle labels and tags agree with custody papers? YES NO
Were all bottles used correct for the requested analyses? YES NO
Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)... NA YES NO
Were all VOC vials free of air bubbles? NA YES NO
Was sufficient amount of sample sent in each bottle? YES NO
Date VOC Trip Blank was made at ARI: NA
Samples Logged by: all Date: 2/13/10 Time: 849
**** Notify Project Manager of discrepancies or concerns ****

| Sample ID on Bottle | Sample ID on COC | Sample ID on Bottle | Sample ID on COC |
|---------------------|------------------|---------------------|------------------|
| | | | |
| | | | |
| | | | |
| | | | |

Additional Notes, Discrepancies, & Resolutions:

By: _____ Date: _____



Small → "sm"
Peabubbles → "pb"
Large → "lg"
Headspace → "hs"

PRESERVATION VERIFICATION 02/13/10

Page 1 of 1



ARI Job No: QJ96

PC: Kelly

VTSR: 02/12/10

Inquiry Number: NONE

Analysis Requested: 02/15/10

Contact: Ernst, Will

Client: The Boeing Company

Logged by: MM

Sample Set Used: Yes-481

Validatable Package: ~~No~~ *Yes*

Deliverables:

Project #:
Project: BP2 Source Control
Sample Site:
SDG No:
Analytical Protocol: In-house

| LOGNUM ARI ID | CLIENT ID | CN >12 | WAD >12 | NH3 <2 | COD <2 | FOG <2 | MET <2 | PHEN <2 | PHOS <2 | TKN <2 | NO23 <2 | TOC <2 | S2 >9 | AK102 <2 | Fe2+ <2 | DMET DOC FLT FLT | ADJUSTED TO | LOT NUMBER | AMOUNT ADDED | DATE/BY |
|------------------|------------------|-----------|------------|-----------|-----------|-----------|-----------|------------|------------|-----------|------------|-----------|----------|-------------|------------|---------------------|----------------|---------------|-----------------|---------|
| 10-4017 QJ96A | PL2SC-W-B-021210 | | | | | | DIS | | | | | | | | | Y | | | | |

pass

QJ96: 000005

Checked By *MM* Date *2/13/10*



ARI Job No: QJ98

PC: Kelly
VTSR: 02/12/10

Project #:
Project: BP2 Source Control
Sample Site:
SDG No:
Analytical Protocol: In-house

Inquiry Number: NONE
Analysis Requested: 02/15/10
Contact: Ernst, Will
Client: The Boeing Company
Logged by: MM
Sample Set Used: Yes-481
Validatable Package: ~~486~~
Deliverables:

yes

| LOGNUM | CLIENT ID | CN | WAD | NH3 | COD | FOG | MET | PHEN | PHOS | TKN | NO23 | TOC | S2 | AK102 | Fe2+ | DMET | DOC | FLT | FLT | PARAMETER | ADJUSTED | LOT | AMOUNT | DATE/BY |
|---------|------------------|-----|-----|-----|-----|-----|-----|------|------|-----|------|-----|----|-------|------|------|-----|-----|-----|-----------|----------|-----|--------|---------|
| 10-4018 | | >12 | >12 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | >9 | <2 | <2 | | | | | | | | | |
| QJ98A | PL2SC-W-B-021210 | | | | | | | | | | | | | | | Y | | | | | | | | |

DIS
pass

00000 : 9810

Checked By WM Date 2/13/10

Case Narrative

prepared
for

The Boeing Company

Project: BP2 Source Control

ARI JOB NO: QJ96, QJ98

prepared
by

Analytical Resources, Inc.

QJ96 : 00007



Case Narrative

Project: Boeing Plant 2 Source Control
ARI IDs: QJ96 and QJ98
Matrix: Water
Date: March 23, 2010

Sample Receipt Information

One water sample was received in good condition at Analytical Resources, Inc. (ARI) on February 12, 2010 under ARI sample delivery groups (SDGs) QJ96 and QJ98. The cooler temperature, as measured by IR thermometer, was 6.6°C. For further details regarding sample receipt, please refer to the enclosed Cooler Receipt Form and Preservation Verification sheet.

The sample was analyzed for the parameters listed below, as requested on the Chain of Custody.

Dissolved Metals by Methods 6010B and 200.8

The sample was digested on 2/16/10. The digest was analyzed on 3/10/10 and 3/19/10 within the method recommended holding times.

Samples: No anomalies were encountered for these samples.

Lab Control(s): All percent recoveries were within control.

Method Blank(s): The method blank was free of contamination.

Dissolved Low-Level Mercury by Method SW7470A

The sample was digested on 2/16/10. The digest was analyzed on 2/19/10 within the method recommended holding times.

Samples: No anomalies were encountered for this sample.

LCS/Blank Spike(s): All percent recoveries were within compliance.

Method Blank(s): Were in control.

Conventional Chemistry Parameters

-pH by EPA Method 150.1-

The samples were analyzed on 2/12/10 - within the method recommended holding time.

Samples: No anomalies were encountered for these samples.

Replicate(s): RPDs/RSDs were in control.

Lab Control(s): All percent recoveries were within compliance.



Summary of Laboratory Control Limits Metals Analyses (All Methods & Sample Matrices)

Effective 5/1/09

Control limits are updated periodically. Assure that you have ARI's current control limits by downloading the files at the time of use. <http://www.arilabs.com/portal/downloads/ARI-CLs.zip>

| Element | Matrix Spike Recovery | LCS Recovery | Replicate RPD |
|-----------|-----------------------|--------------|---------------|
| Aluminum | 75 - 125 | 80 - 120 | ≤ 20% |
| Antimony | 75 - 125 | 80 - 120 | ≤ 20% |
| Arsenic | 75 - 125 | 80 - 120 | ≤ 20% |
| Barium | 75 - 125 | 80 - 120 | ≤ 20% |
| Beryllium | 75 - 125 | 80 - 120 | ≤ 20% |
| Boron | 75 - 125 | 80 - 120 | ≤ 20% |
| Cadmium | 75 - 125 | 80 - 120 | ≤ 20% |
| Calcium | 75 - 125 | 80 - 120 | ≤ 20% |
| Chromium | 75 - 125 | 80 - 120 | ≤ 20% |
| Cobalt | 75 - 125 | 80 - 120 | ≤ 20% |
| Copper | 75 - 125 | 80 - 120 | ≤ 20% |
| Iron | 75 - 125 | 80 - 120 | ≤ 20% |
| Lead | 75 - 125 | 80 - 120 | ≤ 20% |
| Magnesium | 75 - 125 | 80 - 120 | ≤ 20% |
| Manganese | 75 - 125 | 80 - 120 | ≤ 20% |
| Mercury | 75 - 125 | 80 - 120 | ≤ 20% |
| Nickel | 75 - 125 | 80 - 120 | ≤ 20% |
| Potassium | 75 - 125 | 80 - 120 | ≤ 20% |
| Selenium | 75 - 125 | 80 - 120 | ≤ 20% |
| Silica | 75 - 125 | 80 - 120 | ≤ 20% |
| Silver | 75 - 125 | 80 - 120 | ≤ 20% |
| Sodium | 75 - 125 | 80 - 120 | ≤ 20% |
| Strontium | 75 - 125 | 80 - 120 | ≤ 20% |
| Thallium | 75 - 125 | 80 - 120 | ≤ 20% |
| Vanadium | 75 - 125 | 80 - 120 | ≤ 20% |
| Zinc | 75 - 125 | 80 - 120 | ≤ 20% |



Spike Recovery Control Limits for Conventional Wet Chemistry

Effective 5/1/09

Control limits are updated periodically. Assure that you have ARI's current control limits by downloading the files at the time of use. <http://www.arilabs.com/portal/downloads/ARI-CLs.zip>

| | ARI's Control Limits | |
|--------------------------------|----------------------|-----------------|
| Sample Matrix: | Water | Soil / Sediment |
| <i>Matrix Spike Recoveries</i> | % Recovery | % Recovery |
| Ammonia | 75 - 125 | 75 - 125 |
| Bromide | 75 - 125 | 75 - 125 |
| Chloride | 75 - 125 | 75 - 125 |
| Cyanide | 75 - 125 | 75 - 125 |
| Ferrous Iron | 75 - 125 | 75 - 125 |
| Fluoride | 75 - 125 | 75 - 125 |
| Formaldehyde | 75 - 125 | 75 - 125 |
| Hexane Extractable Material | -- - -- | 78 - 114 |
| Hexavalent Chromium | 75 - 125 | 75 - 125 |
| Nitrate/Nitrite | 75 - 125 | 75 - 125 |
| Oil and Grease | 75 - 125 | 75 - 125 |
| Phenol | 75 - 125 | 75 - 125 |
| Phosphorous | 75 - 125 | 75 - 125 |
| Sulfate | 75 - 125 | 75 - 125 |
| Sulfide | 75 - 125 | 75 - 125 |
| Total Kjeldahl Nitrogen | 75 - 125 | 75 - 125 |
| Total Organic Carbon | 75 - 125 | 75 - 125 |
| <i>Duplicate RPDs</i> | | |
| Acidity | ±20% | ±20% |
| Alkalinity | ±20% | ±20% |
| BOD | ±20% | ±20% |
| Cation Exchange | ±20% | ±20% |
| COD | ±20% | ±20% |
| Conductivity | ±20% | ±20% |
| Salinity | ±20% | ±20% |
| Solids | ±20% | ±20% |
| Turbidity | ±20% | ±20% |

Data Summary Package

prepared
for

The Boeing Company

Project: BP2 Source Control

ARI JOB NO: QJ96, QJ98

prepared
by

Analytical Resources, Inc.

METALS ANALYSIS

INORGANICS ANALYSIS DATA SHEET

DISSOLVED METALS

Page 1 of 1


Sample ID: PL2SC-W-B-021210

SAMPLE

Lab Sample ID: QJ96A

LIMS ID: 10-4017

Matrix: Water

Data Release Authorized 

Reported: 03/23/10

QC Report No: QJ96-The Boeing Company

Project: BP2 Source Control

Date Sampled: 02/12/10

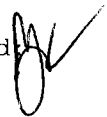
Date Received: 02/12/10

| Prep Meth | Prep Date | Analysis Method | Analysis Date | CAS Number | Analyte | RL | µg/L | Q |
|-----------|-----------|-----------------|---------------|------------------|-------------|-----|------------|---|
| 200.8 | 02/16/10 | 200.8 | 03/19/10 | 7440-38-2 | Arsenic | 0.2 | 0.2 | U |
| 6010B | 02/16/10 | 6010B | 03/10/10 | 7440-43-9 | Cadmium | 2 | 2 | U |
| 6010B | 02/16/10 | 6010B | 03/10/10 | 7440-47-3 | Chromium | 5 | 5 | U |
| 6010B | 02/16/10 | 6010B | 03/10/10 | 7440-50-8 | Copper | 2 | 2 | U |
| 200.8 | 02/16/10 | 200.8 | 03/19/10 | 7439-92-1 | Lead | 1 | 1 | U |
| 6010B | 02/16/10 | 6010B | 03/10/10 | 7440-22-4 | Silver | 3 | 3 | U |
| 6010B | 02/16/10 | 6010B | 03/10/10 | 7440-66-6 | Zinc | 10 | 180 | |

U-Analyte undetected at given RL
RL-Reporting Limit

INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS
Page 1 of 1

Sample ID: LAB CONTROL

Lab Sample ID: QJ96LCS
LIMS ID: 10-4017
Matrix: Water
Data Release Authorized 
Reported: 03/23/10

QC Report No: QJ96-The Boeing Company
Project: BP2 Source Control

Date Sampled: NA
Date Received: NA

BLANK SPIKE QUALITY CONTROL REPORT

| Analyte | Analysis Method | Spike Found | Spike Added | % Recovery | Q |
|----------|-----------------|-------------|-------------|------------|---|
| Arsenic | 200.8 | 26.2 | 25.0 | 105% | |
| Cadmium | 6010B | 484 | 500 | 96.8% | |
| Chromium | 6010B | 459 | 500 | 91.8% | |
| Copper | 6010B | 459 | 500 | 91.8% | |
| Lead | 200.8 | 27 | 25 | 108% | |
| Silver | 6010B | 489 | 500 | 97.8% | |
| Zinc | 6010B | 510 | 500 | 102% | |

Reported in µg/L

N-Control limit not met
Control Limits: 80-120%

INORGANICS ANALYSIS DATA SHEET

DISSOLVED METALS

Page 1 of 1

Sample ID: METHOD BLANK

Lab Sample ID: QJ96MB

LIMS ID: 10-4017

Matrix: Water

Data Release Authorized

Reported: 03/23/10

QC Report No: QJ96-The Boeing Company

Project: BP2 Source Control

Date Sampled: NA

Date Received: NA

| Prep Meth | Prep Date | Analysis Method | Analysis Date | CAS Number | Analyte | RL | µg/L | Q |
|-----------|-----------|-----------------|---------------|------------|----------|-----|------|---|
| 200.8 | 02/16/10 | 200.8 | 03/19/10 | 7440-38-2 | Arsenic | 0.2 | 0.2 | U |
| 6010B | 02/16/10 | 6010B | 03/10/10 | 7440-43-9 | Cadmium | 2 | 2 | U |
| 6010B | 02/16/10 | 6010B | 03/10/10 | 7440-47-3 | Chromium | 5 | 5 | U |
| 6010B | 02/16/10 | 6010B | 03/10/10 | 7440-50-8 | Copper | 2 | 2 | U |
| 200.8 | 02/16/10 | 200.8 | 03/19/10 | 7439-92-1 | Lead | 1 | 1 | U |
| 6010B | 02/16/10 | 6010B | 03/10/10 | 7440-22-4 | Silver | 3 | 3 | U |
| 6010B | 02/16/10 | 6010B | 03/10/10 | 7440-66-6 | Zinc | 10 | 10 | U |


U-Analyte undetected at given RL

RL-Reporting Limit

MERCURY ANALYSIS

INORGANICS ANALYSIS DATA SHEET
Dissolved Mercury by Method SW7470A



Data Release Authorized: 
Reported: 02/20/10
Date Received: 02/12/10
Page 1 of 1

QC Report No: QJ98-The Boeing Company
Project: BP2 Source Control

| Client/ ARI ID | Date Sampled | Matrix | Prep Date Anal Date | RL | Result |
|-------------------|-----------------|--------|------------------------|------|--------|
| PL2SC-W-B-021210 | 02/12/10 | Water | 02/16/10 | 20.0 | 20.0 U |
| QJ98A 10-4018 | | | 02/19/10 | | |
| MB-021610 | NA | Water | 02/16/10 | 20.0 | 20.0 U |
| Method Blank | | | 02/19/10 | | |

Reported in ng/L

RL-Analytical reporting limit
U-Undetected at reported detection limit

INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS
Page 1 of 1

Sample ID: LAB CONTROL


Lab Sample ID: QJ98LCS

QC Report No: QJ98-The Boeing Company

LIMS ID: 10-4018

Project: BP2 Source Control

Matrix: Water

Data Release Authorized: 

Date Sampled: NA

Reported: 02/20/10

Date Received: NA

BLANK SPIKE QUALITY CONTROL REPORT

| Analyte | Analysis Method | Spike Found | Spike Added | % Recovery | Q |
|---------|-----------------|-------------|-------------|------------|---|
| Mercury | 7470A | 171 | 200 | 85.5% | |

Reported in ng/L


N-Control limit not met

Control Limits: 80-120%

GENERAL CHEMISTRY ANALYSIS

SAMPLE RESULTS-CONVENTIONALS
QJ96-The Boeing Company



Matrix: Water
Data Release Authorized: 
Reported: 02/17/10

Project: BP2 Source Control
Event: NA
Date Sampled: 02/12/10
Date Received: 02/12/10

Client ID: PL2SC-W-B-021210
ARI ID: 10-4017 QJ96A

| Analyte | Date Batch | Method | Units | RL | Sample |
|---------|----------------------|-----------|-----------|------|--------|
| pH | 02/12/10 021210#1 | EPA 150.1 | std units | 0.01 | 6.60 |

RL Analytical reporting limit
U Undetected at reported detection limit

REPLICATE RESULTS-CONVENTIONALS
QJ96-The Boeing Company



Matrix: Water
Data Release Authorized:
Reported: 02/17/10

A handwritten signature in black ink, appearing to be 'WJ' or similar, written over the 'Data Release Authorized' line.


Project: BP2 Source Control
Event: NA
Date Sampled: 02/12/10
Date Received: 02/12/10

| Analyte | Method | Date | Units | Sample | Replicate(s) | RPD/RSD |
|--|-----------|----------|-----------|--------|--------------|---------|
| ARI ID: QJ96A Client ID: PL2SC-W-B-021210 | | | | | | |
| pH | EPA 150.1 | 02/12/10 | std units | 6.60 | 6.60 | 0.00 |

pH is evaluated as the Absolute Difference between the values rather than
Relative Percent Difference

LAB CONTROL RESULTS-CONVENTIONALS
QJ96-The Boeing Company



Matrix: Water
Data Release Authorized: 
Reported: 02/17/10

Project: BP2 Source Control
Event: NA
Date Sampled: NA
Date Received: NA

| Analyte/Method | QC ID | Date | Units | LCS | Spike Added | Recovery |
|-----------------|-------|----------|-----------|------|-------------|----------|
| pH EPA 150.1 | ICVL | 02/12/10 | std units | 6.98 | 7.00 | 0.02 |

pH is evaluated as the Absolute Difference between the values rather than Percent Recovery.



Analytical Resources, Incorporated
Analytical Chemists and Consultants

March 29, 2010

Kent Angelos
Golder Associates, Inc.
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

RE: Boeing Plant 2 Source Control
ARI IDs: QL59 / QL62 / QM32 / QM43 / QM45

Dear Kent:

Please find enclosed the original Chain-of-Custody (COC) records, sample receipt documentation, and the final data package for the project referenced above.

Sample receipt information and analytical details are addressed in the Case Narrative.

An electronic copy of this package will be kept on file at ARI. If you have any questions or require additional information, please contact me at your convenience.

Sincerely,
ANALYTICAL RESOURCES, INC.

Kelly Bottem
Client Services Manager
(206) 695-6211
kellyb@arilabs.com
www.arilabs.com

KB/eb

cc: Kent Angelos, Golder Associates Inc., 18300 NE Union Hill Road, Suite 200, Redmond, WA 98052-3333

Chain of Custody
Documentation

prepared
for

The Boeing Company

Project: Boeing Plant 2 Source Control

ARI JOB NO: QL59, QL62, QM32, QM43, QM45

prepared
by

Analytical Resources, Inc.

QL59 : 00002

Chain of Custody Record & Laboratory Analysis Request

| | | |
|--------------------------------------|--------------------------------------|--|
| ARI Assigned Number: <i>GM32</i> | Turn-around Requested: <i>57d</i> | Page: <i>1</i> of <i>1</i> |
| ARI Client Company: <i>BOEING</i> | Phone: | Date: <i>3/3/2010</i> |
| Client Contact: <i>WILL ERNST</i> | | Ice Present? Cooler Temps: No. of Coolers: |

Analytical Resources, Incorporated
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)

| Client Project Name: B2 Source Control | | | | | | Analysis Requested | | | | | | | Notes/Comments | | | |
|--|---|--|---|---|---|---|--|--|--|--|--|--|----------------|--|--|--|
| Client Project #: | | | | | | | | | | | | | | | | |
| Samplers: Jill Lambert, Liz Shear | | | | | | | | | | | | | | | | |
| Sample ID | Date | Time | Matrix | No. Containers | | | | | | | | | | | | |
| P2-285-S | 3/3/2010 | 130 | Fiber bag | 1 | | | | | | | | | | | | |
| P2S C-SS-Z-03 Ø3.2416 | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
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| | | | | | | | | | | | | | | | | |
| Comments/Special Instructions SMS Metals per OAP (see PM) | Relinquished by: (Signature) <i>[Signature]</i> Printed Name: Liz Shear Company: Golder | Received by: (Signature) <i>[Signature]</i> Printed Name: Mikha Mulumba Company: ARI | Relinquished by: (Signature) <i>[Signature]</i> Printed Name: Company: Date & Time: 3/3/2010 1045 | Received by: (Signature) <i>[Signature]</i> Printed Name: Company: Date & Time: 3/3/2010 1045 | Relinquished by: (Signature) <i>[Signature]</i> Printed Name: Company: Date & Time: 3/3/2010 1045 | Received by: (Signature) <i>[Signature]</i> Printed Name: Company: Date & Time: 3/3/2010 1045 | | | | | | | | | | |

Limits of Liability: ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.



Cooler Receipt Form

ARI Client: Boeing
COC No(s): _____ (NA)
Assigned ARI Job No: Gm32

Project Name: BP2 Source Control
Delivered by: Fed-Ex UPS Courier Hand Delivered Other: _____
Tracking No: _____ (NA)

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to cooler? YES (NO)
Were custody papers included with the cooler? YES NO
Were custody papers properly filled out (ink, signed, etc.) YES NO
Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry) AMB
If cooler temperature is out of compliance fill out form 00070F
Cooler Accepted by: 111 Date: 3/3/10 Time: 1045 Temp Gun ID#: _____

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler? YES (NO)
What kind of packing material was used? ... Bubble Wrap Wet Ice Gel Packs Baggies Foam Block Paper Other: _____
Was sufficient ice used (if appropriate)? (NA) YES NO
Were all bottles sealed in individual plastic bags? YES NO
Did all bottles arrive in good condition (unbroken)? YES NO
Were all bottle labels complete and legible? YES NO
Did the number of containers listed on COC match with the number of containers received? YES NO
Did all bottle labels and tags agree with custody papers? YES NO
Were all bottles used correct for the requested analyses? YES NO
Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)... NA YES (NO)
Were all VOC vials free of air bubbles? (NA) YES NO
Was sufficient amount of sample sent in each bottle? YES NO
Date VOC Trip Blank was made at ARI (NA)
Was Sample Split by ARI : (NA) YES Date/Time: _____ Equipment: _____ Split by: _____

Samples Logged by: JP Date: 3/3/10 Time: 1140

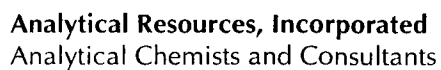
**** Notify Project Manager of discrepancies or concerns ****

| Sample ID on Bottle | Sample ID on COC | Sample ID on Bottle | Sample ID on COC |
|---------------------|------------------|---------------------|------------------|
| | | | |
| | | | |
| | | | |
| | | | |

Additional Notes, Discrepancies, & Resolutions:

By: _____ Date: _____

| | | | |
|--------------------------------------|---------------------------------|--|---|
| Small Air Bubbles ~2mm | Peabubbles 2-4 mm | LARGE Air Bubbles > 4 mm | Small → "sm" Peabubbles → "pb" Large → "lg" Headspace → "hs" |
|--------------------------------------|---------------------------------|--|---|



Cooler Temperature Compliance Form

Completed by: _____ Date: _____ Time: _____

Analytical Resources, Incorporated
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)

| | |
|-------------------|--|
| Page: 1 | of 1 |
| Date: 3/3/2010 | Ice Present? <input checked="" type="checkbox"/> |
| No. of Coolers: 1 | Cooler Temps: 43 |

| | |
|---|--|
| ARI Assigned Number: <i>QW43</i> | Turn-around Requested: <i>Std</i> |
| ARI Client Company: <i>Beig</i> | Phone: |
| Client Contact: <i>Will Ernst</i> | |
| Client Project Name: <i>Beig Phat 2 Source Control</i> | |
| Client Project #: | Samplers: <i>Stambers, L. Sloan</i> |

[illegible]

Limits of Liability: ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.



Cooler Receipt Form

ARI Client: Boeing
COC No(s): NA
Assigned ARI Job No: QM43

Project Name: Boeing Plant 2 Source Control
Delivered by: Fed-Ex UPS Courier Hand Delivered Other: NA
Tracking No: NA

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to cooler? YES NO
Were custody papers included with the cooler? YES NO
Were custody papers properly filled out (ink, signed, etc.) YES NO
Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry)..... 93
If cooler temperature is out of compliance fill out form 00070F Temp Gun ID#: 90877952

Cooler Accepted by: JP Date: 3/3/10 Time: 1500

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler? YES NO
What kind of packing material was used? ... Bubble Wrap Wet Ice Gel Packs Baggies Foam Block Paper Other: NA
Was sufficient ice used (if appropriate)? YES NO
Were all bottles sealed in individual plastic bags? YES NO
Did all bottles arrive in good condition (unbroken)? YES NO
Were all bottle labels complete and legible? YES NO
Did the number of containers listed on COC match with the number of containers received? YES NO
Did all bottle labels and tags agree with custody papers? YES NO
Were all bottles used correct for the requested analyses? YES NO
Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)... NA YES NO
Were all VOC vials free of air bubbles? NA YES NO
Was sufficient amount of sample sent in each bottle? YES NO
Date VOC Trip Blank was made at ARI: NA
Was Sample Split by ARI: NA YES Date/Time: _____ Equipment: _____ Split by: _____

Samples Logged by: JP Date: 3/3/10 Time: 1605

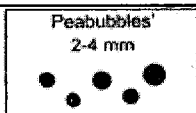
**** Notify Project Manager of discrepancies or concerns ****

| Sample ID on Bottle | Sample ID on COC | Sample ID on Bottle | Sample ID on COC |
|---------------------------|-------------------------|---------------------|------------------|
| <u>PL2SC-EB2-03032010</u> | <u>PL2SC-EB2-030310</u> | | |
| | | | |
| | | | |

Additional Notes, Discrepancies, & Resolutions:

By: _____

Date: _____

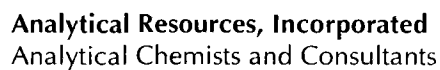


Small → "sm"

Peabubbles → "pb"

Large → "lg"

Headspace → "hs"



Cooler Temperature Compliance Form

Completed by: _____ Date: _____ Time: _____



ARI Job No: QM43

PC: Kelly
VTSR: 03/03/10

Inquiry Number: NONE
Analysis Requested: 03/03/10
Contact: Ernst, Will
Client: The Boeing Company
Logged by: JP
Sample Set Used: Yes-481
Validatable Package: ~~NO~~ Yes
Deliverables:

Project #:
Project: Boeing Plant 2 source Control
Sample Site:
SDG No:
Analytical Protocol: In-house

| LOGNUM | CLIENT ID | CN | WAD | NH3 | COD | FOG | MET | PHEN | PHOS | TKN | NO23 | TOC | S2 | AK102 | Fe2+ | DMET | DOC | FLT | FLT | PARAMETER | ADJUSTED | LOT | AMOUNT | DATE/BY |
|---------|------------------|-----|-----|-----|-----|-----|-----|------|------|-----|------|-----|----|-------|------|------|-----|-----|-----|-----------|----------|-----|--------|---------|
| 10-5291 | | >12 | >12 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | >9 | <2 | <2 | Y | | | | | | | | |
| QM43A | PL2SC-EB2-030310 | | | | | | DIS | | | | | | | | | | | | | | | | | |

0159 : 00009

Checked By JP Date 3/3/10



ARI Job No: QM45

PC: Kelly
VTSR: 03/03/10

Inquiry Number: NONE
Analysis Requested: 03/03/10
Contact: Ernst, Will
Client: The Boeing Company
Logged by: JP
Sample Set Used: Yes-481
Validatable Package: No
Deliverables:

Project #:
Project: Boeing Plant 2 Source Control
Sample Site:
SDG No:
Analytical Protocol: In-house

| LOGNUM | CLIENT ID | CN | WAD | NH3 | COD | POG | MET | PHEN | PHOS | TKN | NO23 | TOC | S2 | AK102 | Fe2+ | DMET | DOC | ADJUSTED | LOT | AMOUNT | DATE/BY |
|---------|------------------|-----|-----|-----|-----|-----|-----|------|------|-----|------|-----|----|-------|------|------|-----|----------|-----|--------|---------|
| 10-5292 | | >12 | >12 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | Y | | | | | |
| QM45A | PL2SC-BE2-030310 | | | | | | DIS | | | | | | | | | | | | | | |

01000 : 5270

Checked By JP Date 3/3/10



Cooler Receipt Form

ARI Client: Beising

COC No(s): _____ (NA)

Assigned ARI Job No: QL59

Project Name: BP2 Source Control

Delivered by: Fed-Ex UPS Courier Hand Delivered Other: _____

Tracking No: _____ (NA)

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of cooler? YES NO

Were custody papers included with the cooler? YES NO

Were custody papers properly filled out (ink, signed, etc.) YES NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry) 7.1

If cooler temperature is out of compliance fill out form 00070F

Temp Gun ID#: 90877952

Cooler Accepted by: SW Date: 2/26/10 Time: 0938

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler? YES NO

What kind of packing material was used? ... Bubble Wrap Wet Ice Gel Packs Baggies Foam Block Paper Other: N/A

Was sufficient ice used (if appropriate)? NA YES NO

Were all bottles sealed in individual plastic bags? YES NO

Did all bottles arrive in good condition (unbroken)? YES NO

Were all bottle labels complete and legible? YES NO

Did the number of containers listed on COC match with the number of containers received? YES NO

Did all bottle labels and tags agree with custody papers? YES NO

Were all bottles used correct for the requested analyses? YES NO

Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)... NA YES NO

Were all VOC vials free of air bubbles? NA YES NO

Was sufficient amount of sample sent in each bottle? YES NO

Date VOC Trip Blank was made at ARI NA

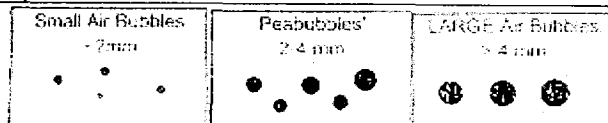
Samples Logged by: JP Date: 2/26/10 Time: 945

**** Notify Project Manager of discrepancies or concerns ****

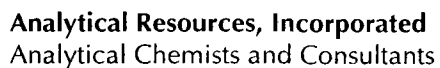
| Sample ID on Bottle | Sample ID on COC | Sample ID on Bottle | Sample ID on COC |
|---------------------|------------------|---------------------|------------------|
| | | | |
| | | | |
| | | | |
| | | | |

Additional Notes, Discrepancies, & Resolutions:

By: _____ Date: _____



Small → "sm"
Peabubbles → "pb"
Large → "lg"
Headspace → "hs"



Cooler Temperature Compliance Form

Completed by: _____ Date: _____ Time: _____



ARI Job No: QL59

PC: Kelly

VTSR: 02/26/10

Inquiry Number: NONE

Analysis Requested: 02/26/10

Contact: Ernst, Will

Client: The Boeing Company

Logged by: JP

Sample Set Used: Yes-481

Validatable Package: No

Deliverables:

Project #:

Project: BP2 Source Control

Sample Site:

SDG No:

Analytical Protocol: In-house

| LOGNUM | ARI ID | CLIENT ID | CN | WAD | NH3 | COD | POG | MET | PHEN | PHOS | TKN | NO23 | TOC | S2 | AK102 | Fe2+ | DMET | DOC | FLT | FLT | PARAMETER | ADJUSTED | LOT | AMOUNT | DATE/BY |
|---------|--------|------------------|-----|-----|-----|-----|-----|-----|------|------|-----|------|-----|----|-------|------|------|-----|-----|-----|-----------|----------|-----|--------|---------|
| 10-4804 | QL59A | PL2SC-W-2-022610 | >12 | >12 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | >9 | <2 | <2 | Y | | | | | | | | |

QL59 : 000000

Checked By JP Date 2/26/10



ARI Job No: QL62

PC: Kelly
VTSR: 02/26/10

Inquiry Number: NONE
Analysis Requested: 02/26/10
Contact: Ernst, Will
Client: The Boeing Company
Logged by: JP
Sample Set Used: Yes-481
Validatable Package: No
Deliverables:

Project #:
Project: BPS Source Control
Sample Site:
SDG No:
Analytical Protocol: In-house

| LOGNUM | CLIENT ID | CN | WAD | NH3 | COD | FOG | MET | PHEN | PHOS | TKN | NO23 | TOC | S2 | AK102 | Fe2+ | DMET | DOC | FLT | FLT | PARAMETER | ADJUSTED TO | LOT NUMBER | AMOUNT ADDED | DATE/BY |
|---------|------------------|-----|-----|-----|-----|-----|-----|------|------|-----|------|-----|----|-------|------|------|-----|-----|-----|-----------|----------------|---------------|-----------------|---------|
| 10-4825 | | >12 | >12 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | >9 | <2 | <2 | | | Y | | | | | | |
| QL62A | PL2SC-W-Z-022610 | | | | | | DIS | | | | | | | | | | | | | | | | | |

QL59:00015

Case Narrative

prepared
for

The Boeing Company

Project: Boeing Plant 2 Source Control

ARI JOB NO: QL59, QL62, QM32, QM43, QM45

prepared
by

Analytical Resources, Inc.

**Case Narrative**

Project: Boeing Plant 2 Source Control
ARI IDs: QL59 / QL62 / QM32 / QM43 / QM45
Matrix: Water
Date: March 29, 2010

Sample Receipt Information

One water sample was received in good condition at Analytical Resources, Inc. (ARI) on February 26, 2010 under ARI Sample Delivery Groups (SDGs) QL59 and QL62. The cooler temperature, as measured by IR thermometer, was 7.1°C. For further details regarding sample receipt, please refer to the enclosed Cooler Receipt Form and Preservation Verification sheet.

One soil sample and one filter bag sample were received in good condition at ARI on March 3, 2010 under SDGs QM32. The samples were received at room temperature. For further details regarding sample receipt, please refer to the enclosed Cooler Receipt Form and Preservation Verification sheet.

One water sample was received in good condition at Analytical Resources, Inc. (ARI) on March 3, 2010 under ARI Sample Delivery Groups (SDGs) QM43 and QM45. The cooler temperature, as measured by IR thermometer, was 9.3°C. For further details regarding sample receipt, please refer to the enclosed Cooler Receipt Form and Preservation Verification sheet.

The samples were analyzed for the parameters listed below, as requested on the Chain of Custodies.

PCBs by Method 8082

The samples were extracted on 3/5/10 and analyzed on 3/8/10 and 3/9/10 - within the method recommended holding time.

Initial calibration(s): All analytes of interest were within method acceptance criteria.

Continuing calibration(s): All analytes of interest were within method acceptance criteria.

Internal Standards: The internal standards were in control.

Surrogates: All surrogate recoveries were within control limits.

Method Blank(s): The method blanks were free of contamination.

Samples: There were no anomalies associated with these samples.

LCS/LCSD(s): The LCS and LCSD were in control.

Total & Dissolved Metals by Methods 6010B, 200.8, 7470A and 7471A

The samples were digested between 2/26/10 and 3/8/10. The digests were analyzed on 3/10/10 and 3/24/10 - within the method recommended holding time.



Case Narrative

Project: Boeing Plant 2 Source Control
ARI IDs: QL59 / QL62 / QM32 / QM43 / QM45
Matrix: Water
Date: March 29, 2010

Samples: No anomalies were encountered for these samples.

Lab Control(s): All percent recoveries were within control.

Method Blank(s): The method blank was free of contamination.

Dissolved Low-Level Mercury by Method 7470A

The samples were digested on 2/26/10 and 3/1/10. The digests were analyzed on 3/1/10 and 3/5/10 - within the method recommended holding time.

Samples: No anomalies were encountered for these samples.

Lab Control(s): All percent recoveries were within control.

Method Blank(s): The method blank was free of contamination.

pH by Method 150.1

The sample was analyzed on 2/26/10 – outside of the method recommended holding time of fifteen minutes.

Samples: No anomalies were encountered for these samples.

Replicate(s): RPDs/RSDs were in control.

Lab Control(s): All percent recoveries were within compliance.



Data Reporting Qualifiers

Effective 7/10/2009

Inorganic Data

- U Indicates that the target analyte was not detected at the reported concentration
- * Duplicate RPD is not within established control limits
- B Reported value is less than the CRDL but \geq the Reporting Limit
- N Matrix Spike recovery not within established control limits
- NA Not Applicable, analyte not spiked
- H The natural concentration of the spiked element is so much greater than the concentration spiked that an accurate determination of spike recovery is not possible
- L Analyte concentration is ≤ 5 times the Reporting Limit and the replicate control limit defaults to ± 1 RL instead of the normal 20% RPD

Organic Data

- U Indicates that the target analyte was not detected at the reported concentration
- * Flagged value is not within established control limits
- B Analyte detected in an associated Method Blank at a concentration greater than one-half of ARI's Reporting Limit or 5% of the regulatory limit or 5% of the analyte concentration in the sample.
- J Estimated concentration when the value is less than ARI's established reporting limits
- D The spiked compound was not detected due to sample extract dilution
- E Estimated concentration calculated for an analyte response above the valid instrument calibration range. A dilution is required to obtain an accurate quantification of the analyte.
- Q Indicates a detected analyte with an initial or continuing calibration that does not meet established acceptance criteria ($<20\%$ RSD, $<20\%$ Drift or minimum RRF).
- S Indicates an analyte response that has saturated the detector. The calculated concentration is not valid; a dilution is required to obtain valid quantification of the analyte



- NA The flagged analyte was not analyzed for
- NR Spiked compound recovery is not reported due to chromatographic interference
- NS The flagged analyte was not spiked into the sample
- M Estimated value for an analyte detected and confirmed by an analyst but with low spectral match parameters. This flag is used only for GC-MS analyses
- M2 The sample contains PCB congeners that do not match any standard Aroclor pattern. The PCBs are identified and quantified as the Aroclor whose pattern most closely matches that of the sample. The reported value is an estimate.
- N The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification"
- Y The analyte is not detected at or above the reported concentration. The reporting limit is raised due to chromatographic interference. The Y flag is equivalent to the U flag with a raised reporting limit.
- C The analyte was positively identified on only one of two chromatographic columns. Chromatographic interference prevented a positive identification on the second column
- P The analyte was detected on both chromatographic columns but the quantified values differ by $\geq 40\%$ RPD with no obvious chromatographic interference

Geotechnical Data

- A The total of all fines fractions. This flag is used to report total fines when only sieve analysis is requested and balances total grain size with sample weight.
- F Samples were frozen prior to particle size determination
- SM Sample matrix was not appropriate for the requested analysis. This normally refers to samples contaminated with an organic product that interferes with the sieving process and/or moisture content, porosity and saturation calculations
- SS Sample did not contain the proportion of "fines" required to perform the pipette portion of the grain size analysis
- W Weight of sample in some pipette aliquots was below the level required for accurate weighting

LCS SOLUTIONS

3/6/2010

| LABL | SOLN ID | TEST | CONC. UG/ML | SOLVENT | EXP. |
|------|---------|--------------|-------------|---------|----------|
| 1 | 1686-1 | PCB 1660 | 20 | ACETONE | 09/01/10 |
| 2# | 1472-3 | BCOC PEST | 10 | ACETONE | NA |
| 3 | 1620-4 | PEST | 02/04/20 | ACETONE | 06/26/10 |
| 4 | 1667-1 | LOW PEST | 0.2/0.4/2 | ACETONE | 06/26/10 |
| 5 | 1677-1 | EPH | 1500 | MECL2 | 11/12/10 |
| 6 | 1702-2 | PCP | 12.5/125 | ACETONE | 02/18/11 |
| 7 | 1705-1 | ABN | 100 | ACETONE | 07/01/10 |
| 8 | 1681-4 | TBT | 2.5 | MECL2 | 12/01/10 |
| 9 | 1682-2 | PORE TBT | .125/.25 | MECL2 | 12/01/10 |
| 10 | 1698-2 | ABN ACID | 100/200 | MECL2 | 07/14/10 |
| 11 | 1642-2 | TPHD | 15000 | ACETONE | 09/07/10 |
| 12 | 1698-1 | ABN BASE | 200 | MEOH | 07/24/10 |
| 13 | 1613-1 | LOW PCB | 2 | ACETONE | 06/08/10 |
| 14* | 1547-1 | LOW ABN ACID | 10/20 | MEOH | 04/10/10 |
| 15* | 1591-3 | SIM PNA | 15/75 | MEOH | 08/28/10 |
| 16 | 1602-3 | DIOXANE | 100 | MEOH | 03/20/10 |
| 17 | 1644-1 | 1248 PCB | 10 | ACETONE | 09/10/10 |
| 18* | 1591-4 | LOW SIM PNA | 1.5 | ACETONE | 08/28/10 |
| 19 | 1685-3 | AK103 | 7500 | ACETONE | 09/03/10 |
| 20 | 1682-4 | PNA | 100 | ACETONE | 12/04/10 |
| 21 | 1593-3 | SKY/BHT | 100 | MEOH | 03/31/10 |
| 22 | 1702-4 | HERB | 12.5/12500 | MEOH | 04/17/10 |
| 23* | 1505-1 | LW ABN BASE | 20 | MEOH | 03/20/10 |
| 24 | 1696-1 | LOW ABN | 10 | ACETONE | 01/13/11 |
| 25# | 1481-1 | DIPHENYL | 100 | MEOH | NA |
| 26 | 1702-5 | OP-PEST | 25 | MEOH | 03/31/10 |
| 27 | 1668-3 | STEROLS | 200 | MEOH | 10/30/10 |
| 28# | 1684-1 | ADD. PEST | 4 | ACETONE | 03/25/10 |
| 29# | 1496-3 | DECANES | 100 | MEOH | NA |
| 30 | 1620-1 | EDB/DBCP | 0.2 | MEOH | 06/22/10 |

LCS SOLUTIONS

3/6/2010

| | | | | | |
|-----------------------------|--------|-------------|--------|---------|----------|
| 31 | 1596-1 | TERPINEOL | 100 | MEOH | 04/03/10 |
| 32 | 1619-3 | GUAIACOL | 50-200 | ACETONE | 04/30/10 |
| 33 | 1639-3 | RETENE | 100 | MEOH | 09/03/10 |
| 34 | 1633-1 | CONGENERS | 2.5 | ACETONE | 08/11/10 |
| 35 | 1674-3 | ALKYL PNA A | 10 | MEOH | 10/28/10 |
| 36 | 1601-3 | ALKYL PNA B | 10 | MEOH | 05/13/10 |
| 50 | 1617-1 | FULL RESIN | 250 | ACETONE | 06/17/10 |
| 51 | 1696-3 | DDTS | 2.5 | ACETONE | 06/03/10 |
| 52 | 1613-5 | 1232 PCB | 20 | ACETONE | 06/16/10 |
| 53 | 1703-3 | DALAPON | 50 | MEOH | 09/11/10 |
| 54 | 1701-2 | PBDE | 0.5 | ACETONE | 02/10/11 |
| #=PROJECT SPECIFIC SOLUTION | | | | | |
| *=REVERIFIED SOLUTION | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

SURR SOLUTIONS

3/6/2010

| LABEL | SOLN ID | TEST | CONC. UG/ML | SOLVENT | EXP. |
|----------------------|---------|------------|-------------|---------|----------|
| A | 1662-3 | ABN | 100/150 | MEOH | 10/08/10 |
| B | 1633-3 | SIM PNA | 15/75 | MEOH | 08/12/10 |
| C* | 1559-1 | SIM ABN | 25/37.5 | MEOH | 03/13/10 |
| D | 1689-2 | LOW PCB | 0.2 | ACETONE | 12/29/10 |
| E | 1661-2 | HERB | 62.5 | MEOH | 10/02/10 |
| F | 1683-3 | PCP | 12.5 | ACETONE | 12/09/10 |
| G* | 1534-1 | 1,4DIOXANE | 100 | MEOH | 02/20/10 |
| H | 1594-1 | OP-PEST | 25 | MEOH | 04/01/10 |
| I | 1634-1 | LOW S. PNA | 1.5 | MEOH | 08/12/10 |
| J | 1681-2 | TBT-PORE | 0.125 | MECL2 | 12/01/10 |
| K | 1689-1 | MED PCB | 20 | ACETONE | 12/29/10 |
| L | 1681-1 | TBT | 2.5 | MECL2 | 12/01/10 |
| M | 1682-1 | EPH | 1500 | MECL2 | 09/17/10 |
| N | 1689-3 | PCB | 2 | ACETONE | 12/29/10 |
| O | 1699-1 | TPH | 450 | MECL2 | 07/02/10 |
| P | 1666-3 | HCID | 2250 | MECL2 | 05/06/10 |
| Q | 1620-2 | EDB | 1 | MEOH | 06/22/10 |
| R | 1615-1 | RESIN ACID | 250 | ACETONE | 06/17/10 |
| S# | 1568-5 | PBDE | .25 | MEOH | NA |
| T | 1674-2 | ALKYL PNA | 10 | MEOH | 07/30/10 |
| U | 1633-1 | CONGENER | 2.5 | ACETONE | 08/11/10 |
| V | | | | | |
| *reverified solution | | | | | |
| #project specific | | | | | |
| Y | | | | | |
| Z | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |



Spike Recovery Control Limits Analysis of PCB / Aroclors in Aqueous Samples - EPA SW-846 Methods 8081 & 8082 ^(1,2)

Effective 5/1/09

Control limits are updated periodically. Assure that you have ARI's current control limits by downloading the files at the time of use. <http://www.arilabs.com/portal/downloads/ARI-CLs.zip>

| Analytical Method: | Standard Analysis | MTCA Analysis | Low Level Analysis | Manchester Extraction |
|---|-------------------|-----------------|--------------------|-------------------------|
| Sample Weight / Final Volume: | 500 / 5 mL | 500 / 1 mL | 1000 / 0.5 mL | 3000 / 1 mL |
| LCS Spike Recovery ⁽⁴⁾ | | | | |
| Aroclor 1016 | 45 - 121 | 36 - 100 | 44 - 117 | 30 - 160 ⁽³⁾ |
| Aroclor 1260 | 54 - 129 | 41 - 113 | 46 - 131 | 30 - 160 ⁽³⁾ |
| | | | | |
| Method Blank/LCS Surrogate Recovery | | | | |
| Tetrachloro- <i>meta</i> -xylene (TCMX) | 40 - 118 | 29 - 100 | 31 - 100 | 30 - 160 ⁽³⁾ |
| Decachlorobiphenyl | 41 - 111 | 35 - 116 | 32 - 108 | 30 - 160 ⁽³⁾ |
| | | | | |
| Sample Surrogate Recovery | | | | |
| Tetrachloro- <i>meta</i> -xylene (TCMX) | 38 - 118 | 25 - 100 | 21 - 100 | 30 - 160 ⁽³⁾ |
| Decachlorobiphenyl | 29 - 118 | 10 - 128 | 19 - 111 | 30 - 160 ⁽³⁾ |

(1) Control Limits calculated using all data generated 1/1/08 through 12/1/08.

(2) Highlighted control limits (**bold font**) adjusted to demonstrate that ARI does not use control limits < 10 for the lower limit or < 100 for the upper limit.

(3) 30 – 160 are default, advisory control limits used when there is insufficient data to calculate historic control limits. **DO NOT** use these limits as the sole reason to reject the data from a batch of analyses.

(4) Laboratory Control Sample (LCS) spike recovery control limits also used as advisory control limits for sample matrix spike (MS) analyzes. MS recovery values are advisory and not used to assess the acceptability of an analytical batch.



Summary of Laboratory Control Limits

Default limits of 30-160% recovery and 30% RPD apply for all organic analytes when laboratory generated control limits are not available on ARI's web site. Default limits for all inorganic analytes are 75-125% recovery and 25% RPD.

ARI's laboratory generated Quality Control Limits may be superseded by project specific data quality objectives (DQO) provided by ARI's clients. The use of project specific DQO must be approved by ARI's Laboratory and QA Program Managers.



Summary of Laboratory Control Limits Metals Analyses (All Methods & Sample Matrices)

Effective 5/1/09

Control limits are updated periodically. Assure that you have ARI's current control limits by downloading the files at the time of use. <http://www.arilabs.com/portal/downloads/ARI-CLs.zip>

| Element | Matrix Spike Recovery | LCS Recovery | Replicate RPD |
|-----------|-----------------------|--------------|---------------|
| Aluminum | 75 - 125 | 80 - 120 | ≤ 20% |
| Antimony | 75 - 125 | 80 - 120 | ≤ 20% |
| Arsenic | 75 - 125 | 80 - 120 | ≤ 20% |
| Barium | 75 - 125 | 80 - 120 | ≤ 20% |
| Beryllium | 75 - 125 | 80 - 120 | ≤ 20% |
| Boron | 75 - 125 | 80 - 120 | ≤ 20% |
| Cadmium | 75 - 125 | 80 - 120 | ≤ 20% |
| Calcium | 75 - 125 | 80 - 120 | ≤ 20% |
| Chromium | 75 - 125 | 80 - 120 | ≤ 20% |
| Cobalt | 75 - 125 | 80 - 120 | ≤ 20% |
| Copper | 75 - 125 | 80 - 120 | ≤ 20% |
| Iron | 75 - 125 | 80 - 120 | ≤ 20% |
| Lead | 75 - 125 | 80 - 120 | ≤ 20% |
| Magnesium | 75 - 125 | 80 - 120 | ≤ 20% |
| Manganese | 75 - 125 | 80 - 120 | ≤ 20% |
| Mercury | 75 - 125 | 80 - 120 | ≤ 20% |
| Nickel | 75 - 125 | 80 - 120 | ≤ 20% |
| Potassium | 75 - 125 | 80 - 120 | ≤ 20% |
| Selenium | 75 - 125 | 80 - 120 | ≤ 20% |
| Silica | 75 - 125 | 80 - 120 | ≤ 20% |
| Silver | 75 - 125 | 80 - 120 | ≤ 20% |
| Sodium | 75 - 125 | 80 - 120 | ≤ 20% |
| Strontium | 75 - 125 | 80 - 120 | ≤ 20% |
| Thallium | 75 - 125 | 80 - 120 | ≤ 20% |
| Vanadium | 75 - 125 | 80 - 120 | ≤ 20% |
| Zinc | 75 - 125 | 80 - 120 | ≤ 20% |



Spike Recovery Control Limits for Conventional Wet Chemistry

Effective 5/1/09

Control limits are updated periodically. Assure that you have ARI's current control limits by downloading the files at the time of use. <http://www.arilabs.com/portal/downloads/ARI-CLs.zip>

| | ARI's Control Limits | |
|--------------------------------|----------------------|-----------------|
| Sample Matrix: | Water | Soil / Sediment |
| <i>Matrix Spike Recoveries</i> | % Recovery | % Recovery |
| Ammonia | 75 - 125 | 75 - 125 |
| Bromide | 75 - 125 | 75 - 125 |
| Chloride | 75 - 125 | 75 - 125 |
| Cyanide | 75 - 125 | 75 - 125 |
| Ferrous Iron | 75 - 125 | 75 - 125 |
| Fluoride | 75 - 125 | 75 - 125 |
| Formaldehyde | 75 - 125 | 75 - 125 |
| Hexane Extractable Material | -- - -- | 78 - 114 |
| Hexavalent Chromium | 75 - 125 | 75 - 125 |
| Nitrate/Nitrite | 75 - 125 | 75 - 125 |
| Oil and Grease | 75 - 125 | 75 - 125 |
| Phenol | 75 - 125 | 75 - 125 |
| Phosphorous | 75 - 125 | 75 - 125 |
| Sulfate | 75 - 125 | 75 - 125 |
| Sulfide | 75 - 125 | 75 - 125 |
| Total Kjeldahl Nitrogen | 75 - 125 | 75 - 125 |
| Total Organic Carbon | 75 - 125 | 75 - 125 |
| <i>Duplicate RPDs</i> | | |
| Acidity | ±20% | ±20% |
| Alkalinity | ±20% | ±20% |
| BOD | ±20% | ±20% |
| Cation Exchange | ±20% | ±20% |
| COD | ±20% | ±20% |
| Conductivity | ±20% | ±20% |
| Salinity | ±20% | ±20% |
| Solids | ±20% | ±20% |
| Turbidity | ±20% | ±20% |

Data Summary Package

prepared
for

The Boeing Company

Project: Boeing Plant 2 Source Control


ARI JOB NO: QL59, QL62, QM32, QM43, QM45

prepared
by

Analytical Resources, Inc.

PCB ANALYSIS

Sample ID: PL2SC-SS-Z-03032010
SAMPLE

Lab Sample ID: QM32A
LIMS ID: 10-5247
Matrix: Filter Bag
Data Release Authorized: 
Reported: 03/12/10

QC Report No: QM32-The Boeing Company
Project: BP2 Source Control

Date Sampled: 03/03/10
Date Received: 03/03/10

Date Extracted: 03/05/10
Date Analyzed: 03/09/10 16:10
Instrument/Analyst: ECD5/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes

Sample Amount: 1.00 Filter Bag
Final Extract Volume: 25 mL
Dilution Factor: 50.0
Silica Gel: Yes

| CAS Number | Analyte | RL | Result |
|------------|--------------|----|--------|
| 12674-11-2 | Aroclor 1016 | 25 | < 25 U |
| 53469-21-9 | Aroclor 1242 | 25 | < 25 U |
| 12672-29-6 | Aroclor 1248 | 62 | < 62 Y |
| 11097-69-1 | Aroclor 1254 | 25 | 100 P |
| 11096-82-5 | Aroclor 1260 | 25 | 110 |
| 11104-28-2 | Aroclor 1221 | 25 | < 25 U |
| 11141-16-5 | Aroclor 1232 | 25 | < 25 U |

Reported in Total μ g

PCB Surrogate Recovery

| | |
|-----------------------|------|
| Decachlorobiphenyl | 118% |
| Tetrachlorometaxylene | 110% |

SW8082/PCB SURROGATE RECOVERY SUMMARY

Matrix: Filter Bag

QC Report No: QM32-The Boeing Company
Project: BP2 Source Control

| <u>Client ID</u> | <u>DCBP</u> | <u>TCMX</u> | <u>TOT OUT</u> |
|---------------------|-------------|-------------|----------------|
| MB-030510 | 62.8% | 60.8% | 0 |
| LCS-030510 | 65.5% | 62.0% | 0 |
| LCSD-030510 | 65.8% | 60.5% | 0 |
| PL2SC-SS-Z-03032010 | 118% | 110% | 0 |

| | <u>LCS/MB LIMITS</u> | <u>QC LIMITS</u> |
|--------------------------------|----------------------|------------------|
| (DCBP) = Decachlorobiphenyl | (30-160) | (30-160) |
| (TCMX) = Tetrachlorometaxylene | (30-160) | (30-160) |

Prep Method: SW3550B
Log Number Range: 10-5247 to 10-5247

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082
Page 1 of 1

Sample ID: LCS-030510
LCS/LCSD

Lab Sample ID: LCS-030510
LIMS ID: 10-5247
Matrix: Filter Bag
Data Release Authorized: *[Signature]*
Reported: 03/12/10

QC Report No: QM32-The Boeing Company
Project: BP2 Source Control

Date Sampled: 03/03/10
Date Received: 03/03/10

Date Extracted LCS/LCSD: 03/05/10

Sample Amount LCS: 1.00 Filter Bag
LCSD: 1.00 Filter Bag

Date Analyzed LCS: 03/09/10 15:28
LCSD: 03/09/10 15:49

Final Extract Volume LCS: 5.0 mL
LCSD: 5.0 mL

Instrument/Analyst LCS: ECD5/JGR
LCSD: ECD5/JGR

Dilution Factor LCS: 1.00
LCSD: 1.00

GPC Cleanup: No
Sulfur Cleanup: Yes

Silica Gel: Yes
Acid Cleanup: Yes

| Analyte | LCS | Spike Added-LCS | LCS Recovery | LCSD | Spike Added-LCSD | LCSD Recovery | RPD |
|--------------|-----|--------------------|-----------------|------|---------------------|------------------|------|
| Aroclor 1016 | 2.3 | 2.5 | 92.0% | 2.3 | 2.5 | 92.0% | 0.0% |
| Aroclor 1260 | 1.7 | 2.5 | 68.0% | 1.7 | 2.5 | 68.0% | 0.0% |

PCB Surrogate Recovery

| | LCS | LCSD |
|-----------------------|-------|-------|
| Decachlorobiphenyl | 65.5% | 65.8% |
| Tetrachlorometaxylene | 62.0% | 60.5% |

Reported in Total μg
RPD calculated using sample concentrations per SW846.

4
PCB METHOD BLANK SUMMARY

BLANK NO.

QM32MB1

Lab Name: ANALYTICAL RESOURCES, INC

Client: THE BOEING COMPANY

ARI Job No.: QM32

Project: BP2 SOURCE CONTROL

Lab Sample ID: QM32MB1

Lab File ID: 0309B006

Date Extracted: 03/05/10

Matrix: SOLID

Date Analyzed: 03/09/10

Instrument ID: ECD5

Time Analyzed: 1506

GC Columns: ZB5/ZB35


THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

| | CLIENT SAMPLE NO. ===== | LAB SAMPLE ID ===== | DATE ANALYZED ===== |
|----|-------------------------------|---------------------------|---------------------------|
| 01 | QM32LCS1 | QM32LCS1 | 03/09/10 |
| 02 | QM32LCSD1 | QM32LCSD1 | 03/09/10 |
| 03 | PL2SC-SS-Z-03032010 | QM32A | 03/09/10 |

ALL RUNS ARE DUAL COLUMN

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082
Page 1 of 1

Sample ID: MB-030510
METHOD BLANK

Lab Sample ID: MB-030510
LIMS ID: 10-5247
Matrix: Filter Bag
Data Release Authorized: 
Reported: 03/12/10

QC Report No: QM32-The Boeing Company
Project: BP2 Source Control

Date Sampled: NA
Date Received: NA

Date Extracted: 03/05/10
Date Analyzed: 03/09/10 15:06
Instrument/Analyst: ECD5/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes

Sample Amount: 1.00 Filter Bag
Final Extract Volume: 5.0 mL
Dilution Factor: 1.00
Silica Gel: Yes

| CAS Number | Analyte | RL | Result |
|------------|--------------|-----|---------|
| 12674-11-2 | Aroclor 1016 | 0.1 | < 0.1 U |
| 53469-21-9 | Aroclor 1242 | 0.1 | < 0.1 U |
| 12672-29-6 | Aroclor 1248 | 0.1 | < 0.1 U |
| 11097-69-1 | Aroclor 1254 | 0.1 | < 0.1 U |
| 11096-82-5 | Aroclor 1260 | 0.1 | < 0.1 U |
| 11104-28-2 | Aroclor 1221 | 0.1 | < 0.1 U |
| 11141-16-5 | Aroclor 1232 | 0.1 | < 0.1 U |

Reported in Total μ g

PCB Surrogate Recovery

| | |
|-----------------------|-------|
| Decachlorobiphenyl | 62.8% |
| Tetrachlorometaxylene | 60.8% |

ORGANICS ANALYSIS DATA SHEET

PCB by GC/ECD Method SW8082

Page 1 of 1

Sample ID: PL2SC-EB2-030310

SAMPLE

Lab Sample ID: QM43A

LIMS ID: 10-5291

Matrix: Water

Data Release Authorized: *[Signature]*

Reported: 03/15/10

QC Report No: QM43-The Boeing Company

Project: Boeing Plant 2 source Control

Date Sampled: 03/03/10

Date Received: 03/03/10

Date Extracted: 03/05/10

Date Analyzed: 03/08/10 16:16

Instrument/Analyst: ECD5/JGR

GPC Cleanup: No

Sulfur Cleanup: Yes

Sample Amount: 500 mL

Final Extract Volume: 5.0 mL

Dilution Factor: 1.00

Silica Gel: No

Acid Cleanup: Yes

| CAS Number | Analyte | RL | Result |
|------------|--------------|-----|---------|
| 12674-11-2 | Aroclor 1016 | 1.0 | < 1.0 U |
| 53469-21-9 | Aroclor 1242 | 1.0 | < 1.0 U |
| 12672-29-6 | Aroclor 1248 | 1.0 | < 1.0 U |
| 11097-69-1 | Aroclor 1254 | 1.0 | < 1.0 U |
| 11096-82-5 | Aroclor 1260 | 1.0 | < 1.0 U |
| 11104-28-2 | Aroclor 1221 | 1.0 | < 1.0 U |
| 11141-16-5 | Aroclor 1232 | 1.0 | < 1.0 U |

Reported in µg/L (ppb)

PCB Surrogate Recovery

| | |
|-----------------------|-------|
| Decachlorobiphenyl | 46.5% |
| Tetrachlorometaxylene | 74.2% |

SW8082/PCB WATER SURROGATE RECOVERY SUMMARY

Matrix: Water


QC Report No: QM43-The Boeing Company
Project: Boeing Plant 2 source Control

| Client ID | DCBP % REC | DCBP LCL-UCL | TCMX % REC | TCMX LCL-UCL | TOT OUT |
|------------------|---------------|-----------------|---------------|-----------------|---------|
| MB-030510 | 54.5% | 41-111 | 58.0% | 40-118 | 0 |
| LCS-030510 | 60.5% | 41-111 | 63.8% | 40-118 | 0 |
| LCSD-030510 | 57.0% | 41-111 | 65.2% | 40-118 | 0 |
| PL2SC-EB2-030310 | 46.5% | 29-118 | 74.2% | 38-118 | 0 |

Prep Method: SW3510C
Log Number Range: 10-5291 to 10-5291

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082
Page 1 of 1

Sample ID: LCS-030510
LCS/LCSD

Lab Sample ID: LCS-030510
LIMS ID: 10-5291
Matrix: Water
Data Release Authorized: 
Reported: 03/15/10

QC Report No: QM43-The Boeing Company
Project: Boeing Plant 2 source Control

Date Sampled: NA
Date Received: NA

Date Extracted LCS/LCSD: 03/05/10

Sample Amount LCS: 500 mL

LCSD: 500 mL

Date Analyzed LCS: 03/08/10 15:33

Final Extract Volume LCS: 5.0 mL

LCSD: 03/08/10 15:55

LCSD: 5.0 mL

Instrument/Analyst LCS: ECD5/JGR

Dilution Factor LCS: 1.00

LCSD: ECD5/JGR

LCSD: 1.00

GPC Cleanup: No

Silica Gel: No

Sulfur Cleanup: Yes

Acid Cleanup: Yes

| Analyte | Spike | | LCS Recovery | Spike | | LCSD Recovery | RPD |
|--------------|-------|-----------|-----------------|-------|------------|------------------|------|
| | LCS | Added-LCS | | LCS | Added-LCSD | | |
| Aroclor 1016 | 4.71 | 5.00 | 94.2% | 4.85 | 5.00 | 97.0% | 2.9% |
| Aroclor 1260 | 3.46 | 5.00 | 69.2% | 3.42 | 5.00 | 68.4% | 1.2% |

PCB Surrogate Recovery

| | LCS | LCSD |
|-----------------------|-------|-------|
| Decachlorobiphenyl | 60.5% | 57.0% |
| Tetrachlorometaxylene | 63.8% | 65.2% |

Results reported in $\mu\text{g/L}$

RPD calculated using sample concentrations per SW846.

4
PCB METHOD BLANK SUMMARY

BLANK NO.

QM43MBW1

Lab Name: ANALYTICAL RESOURCES, INC

Client: THE BOEING COMPANY

ARI Job No.: QM43

Project: BOEING PLANT 2 SOURC

Lab Sample ID: QM43MBW1

Lab File ID: 0308B010

Date Extracted: 03/05/10

Matrix: LIQUID

Date Analyzed: 03/08/10

Instrument ID: ECD5

Time Analyzed: 1512

GC Columns: ZB5/ZB35


THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

| | CLIENT SAMPLE NO. ===== | LAB SAMPLE ID ===== | DATE ANALYZED ===== |
|----|-------------------------------|---------------------------|---------------------------|
| 01 | QM43LCSW1 | QM43LCSW1 | 03/08/10 |
| 02 | QM43LCSDW1 | QM43LCSDW1 | 03/08/10 |
| 03 | PL2SC-EB2-030310 | QM43A | 03/08/10 |

ALL RUNS ARE DUAL COLUMN

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082
Page 1 of 1

Sample ID: MB-030510
METHOD BLANK

Lab Sample ID: MB-030510
LIMS ID: 10-5291
Matrix: Water
Data Release Authorized: 
Reported: 03/15/10

QC Report No: QM43-The Boeing Company
Project: Boeing Plant 2 source Control

Date Sampled: NA
Date Received: NA

Date Extracted: 03/05/10
Date Analyzed: 03/08/10 15:12
Instrument/Analyst: ECD5/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes

Sample Amount: 500 mL
Final Extract Volume: 5.0 mL
Dilution Factor: 1.00
Silica Gel: No
Acid Cleanup: Yes

| CAS Number | Analyte | RL | Result |
|------------|--------------|-----|---------|
| 12674-11-2 | Aroclor 1016 | 1.0 | < 1.0 U |
| 53469-21-9 | Aroclor 1242 | 1.0 | < 1.0 U |
| 12672-29-6 | Aroclor 1248 | 1.0 | < 1.0 U |
| 11097-69-1 | Aroclor 1254 | 1.0 | < 1.0 U |
| 11096-82-5 | Aroclor 1260 | 1.0 | < 1.0 U |
| 11104-28-2 | Aroclor 1221 | 1.0 | < 1.0 U |
| 11141-16-5 | Aroclor 1232 | 1.0 | < 1.0 U |

Reported in $\mu\text{g/L}$ (ppb)

PCB Surrogate Recovery

| | |
|-----------------------|-------|
| Decachlorobiphenyl | 54.5% |
| Tetrachlorometaxylene | 58.0% |

METALS ANALYSIS

INORGANICS ANALYSIS DATA SHEET

DISSOLVED METALS

Page 1 of 1

Sample ID: PL2SC-W-Z-022610

SAMPLE

Lab Sample ID: QL59A

LIMS ID: 10-4804

Matrix: Water

Data Release Authorized:

Reported: 03/23/10

QC Report No: QL59-The Boeing Company

Project: BP2 Source Control

Date Sampled: 02/26/10

Date Received: 02/26/10

| Prep Meth | Prep Date | Analysis Method | Analysis Date | CAS Number | Analyte | RL | µg/L | Q |
|-----------|-----------|-----------------|---------------|------------|----------|-----|------|---|
| 200.8 | 03/01/10 | 200.8 | 03/19/10 | 7440-38-2 | Arsenic | 0.2 | 1.0 | |
| 6010B | 02/26/10 | 6010B | 03/10/10 | 7440-43-9 | Cadmium | 2 | 2 | U |
| 6010B | 02/26/10 | 6010B | 03/10/10 | 7440-47-3 | Chromium | 5 | 5 | U |
| 6010B | 02/26/10 | 6010B | 03/10/10 | 7440-50-8 | Copper | 2 | 2 | U |
| 200.8 | 03/01/10 | 200.8 | 03/19/10 | 7439-92-1 | Lead | 1 | 1 | U |
| 6010B | 02/26/10 | 6010B | 03/10/10 | 7440-22-4 | Silver | 3 | 3 | U |
| 6010B | 02/26/10 | 6010B | 03/10/10 | 7440-66-6 | Zinc | 10 | 30 | |

U-Analyte undetected at given RL

RL-Reporting Limit


INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS
Page 1 of 1

Sample ID: LAB CONTROL

Lab Sample ID: QL59LCS

LIMS ID: 10-4804

Matrix: Water

Data Release Authorized: 

Reported: 03/23/10

QC Report No: QL59-The Boeing Company

Project: BP2 Source Control

Date Sampled: NA

Date Received: NA

BLANK SPIKE QUALITY CONTROL REPORT

| Analyte | Analysis Method | Spike Found | Spike Added | % Recovery | Q |
|----------|-----------------|-------------|-------------|------------|---|
| Arsenic | 200.8 | 26.6 | 25.0 | 106% | |
| Cadmium | 6010B | 486 | 500 | 97.2% | |
| Chromium | 6010B | 471 | 500 | 94.2% | |
| Copper | 6010B | 462 | 500 | 92.4% | |
| Lead | 200.8 | 27 | 25 | 108% | |
| Silver | 6010B | 492 | 500 | 98.4% | |
| Zinc | 6010B | 500 | 500 | 100% | |

Reported in µg/L

N-Control limit not met

Control Limits: 80-120%


INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS
Page 1 of 1

Sample ID: METHOD BLANK

Lab Sample ID: QL59MB

LIMS ID: 10-4804

Matrix: Water

Data Release Authorized: 

Reported: 03/23/10

QC Report No: QL59-The Boeing Company

Project: BP2 Source Control

Date Sampled: NA

Date Received: NA

| Prep Meth | Prep Date | Analysis Method | Analysis Date | CAS Number | Analyte | RL | µg/L | Q |
|-----------|-----------|-----------------|---------------|------------|----------|-----|------|---|
| 200.8 | 03/01/10 | 200.8 | 03/19/10 | 7440-38-2 | Arsenic | 0.2 | 0.2 | U |
| 6010B | 02/26/10 | 6010B | 03/10/10 | 7440-43-9 | Cadmium | 2 | 2 | U |
| 6010B | 02/26/10 | 6010B | 03/10/10 | 7440-47-3 | Chromium | 5 | 5 | U |
| 6010B | 02/26/10 | 6010B | 03/10/10 | 7440-50-8 | Copper | 2 | 2 | U |
| 200.8 | 03/01/10 | 200.8 | 03/19/10 | 7439-92-1 | Lead | 1 | 1 | U |
| 6010B | 02/26/10 | 6010B | 03/10/10 | 7440-22-4 | Silver | 3 | 3 | U |
| 6010B | 02/26/10 | 6010B | 03/10/10 | 7440-66-6 | Zinc | 10 | 10 | U |

U-Analyte undetected at given RL

RL-Reporting Limit

INORGANICS ANALYSIS DATA SHEET

TOTAL METALS

Page 1 of 1


Sample ID: PL2SC-SS-Z-03032010

SAMPLE

Lab Sample ID: QM32B

LIMS ID: 10-5248

Matrix: Soil

Data Release Authorized: 

Reported: 03/25/10

QC Report No: QM32-The Boeing Company

Project: BP2 Source Control

Date Sampled: 03/03/10

Date Received: 03/03/10

Percent Total Solids: 37.5%

| Prep Meth | Prep Date | Analysis Method | Analysis Date | CAS Number | Analyte | RL | mg/kg-dry | Q |
|-----------|-----------|-----------------|---------------|------------|----------|------|-----------|---|
| 3050B | 03/08/10 | 200.8 | 03/24/10 | 7440-38-2 | Arsenic | 0.5 | 26.5 | |
| 3050B | 03/08/10 | 6010B | 03/10/10 | 7440-43-9 | Cadmium | 0.5 | 2.7 | |
| 3050B | 03/08/10 | 6010B | 03/10/10 | 7440-47-3 | Chromium | 1 | 262 | |
| 3050B | 03/08/10 | 6010B | 03/10/10 | 7440-50-8 | Copper | 0.5 | 274 | |
| 3050B | 03/08/10 | 200.8 | 03/24/10 | 7439-92-1 | Lead | 3 | 229 | |
| CLP | 03/08/10 | 7471A | 03/09/10 | 7439-97-6 | Mercury | 0.06 | 0.30 | |
| 3050B | 03/08/10 | 6010B | 03/10/10 | 7440-22-4 | Silver | 0.7 | 1.1 | |
| 3050B | 03/08/10 | 6010B | 03/10/10 | 7440-66-6 | Zinc | 2 | 985 | |

U-Analyte undetected at given RL

RL-Reporting Limit

INORGANICS ANALYSIS DATA SHEET

TOTAL METALS


Page 1 of 1

Sample ID: LAB CONTROL

Lab Sample ID: QM32LCS

LIMS ID: 10-5248

Matrix: Soil

Data Release Authorized: 

Reported: 03/25/10

QC Report No: QM32-The Boeing Company

Project: BP2 Source Control

Date Sampled: NA

Date Received: NA

BLANK SPIKE QUALITY CONTROL REPORT

| Analyte | Analysis Method | Spike Found | Spike Added | % Recovery | Q |
|----------|-----------------|-------------|-------------|------------|---|
| Arsenic | 200.8 | 26.2 | 25.0 | 105% | |
| Cadmium | 6010B | 47.9 | 50.0 | 95.8% | |
| Chromium | 6010B | 46.7 | 50.0 | 93.4% | |
| Copper | 6010B | 47.6 | 50.0 | 95.2% | |
| Lead | 200.8 | 26 | 25 | 104% | |
| Mercury | 7471A | 0.50 | 0.50 | 100% | |
| Silver | 6010B | 50.3 | 50.0 | 101% | |
| Zinc | 6010B | 51 | 50 | 102% | |

Reported in mg/kg-dry

N-Control limit not met

NA-Not Applicable, Analyte Not Spiked

Control Limits: 80-120%

INORGANICS ANALYSIS DATA SHEET

TOTAL METALS

Page 1 of 1

Sample ID: METHOD BLANK

Lab Sample ID: QM32MB

LIMS ID: 10-5248

Matrix: Soil

Data Release Authorized:

Reported: 03/25/10

QC Report No: QM32-The Boeing Company

Project: BP2 Source Control

Date Sampled: NA

Date Received: NA

Percent Total Solids: NA

| Prep Meth | Prep Date | Analysis Method | Analysis Date | CAS Number | Analyte | RL | mg/kg-dry | Q |
|-----------|-----------|-----------------|---------------|------------|----------|------|-----------|---|
| 3050B | 03/08/10 | 200.8 | 03/24/10 | 7440-38-2 | Arsenic | 0.2 | 0.2 | U |
| 3050B | 03/08/10 | 6010B | 03/10/10 | 7440-43-9 | Cadmium | 0.2 | 0.2 | U |
| 3050B | 03/08/10 | 6010B | 03/10/10 | 7440-47-3 | Chromium | 0.5 | 0.5 | U |
| 3050B | 03/08/10 | 6010B | 03/10/10 | 7440-50-8 | Copper | 0.2 | 0.2 | U |
| 3050B | 03/08/10 | 200.8 | 03/24/10 | 7439-92-1 | Lead | 1 | 1 | U |
| CLP | 03/08/10 | 7471A | 03/09/10 | 7439-97-6 | Mercury | 0.02 | 0.02 | U |
| 3050B | 03/08/10 | 6010B | 03/10/10 | 7440-22-4 | Silver | 0.3 | 0.3 | U |
| 3050B | 03/08/10 | 6010B | 03/10/10 | 7440-66-6 | Zinc | 1 | 1 | U |

U-Analyte undetected at given RL
RL-Reporting Limit

INORGANICS ANALYSIS DATA SHEET

DISSOLVED METALS

Page 1 of 1


Sample ID: PL2SC-EB2-030310

SAMPLE

Lab Sample ID: QM43A

LIMS ID: 10-5291

Matrix: Water

Data Release Authorized: 

Reported: 03/25/10

QC Report No: QM43-The Boeing Company

Project: Boeing Plant 2 source Control

Date Sampled: 03/03/10

Date Received: 03/03/10

| Prep Meth | Prep Date | Analysis Method | Analysis Date | CAS Number | Analyte | RL | µg/L | Q |
|-----------|-----------|-----------------|---------------|------------------|-------------|-----|------|---|
| 200.8 | 03/04/10 | 200.8 | 03/24/10 | 7440-38-2 | Arsenic | 0.2 | 0.2 | U |
| 6010B | 03/04/10 | 6010B | 03/10/10 | 7440-43-9 | Cadmium | 2 | 2 | U |
| 6010B | 03/04/10 | 6010B | 03/10/10 | 7440-47-3 | Chromium | 5 | 5 | U |
| 6010B | 03/04/10 | 6010B | 03/10/10 | 7440-50-8 | Copper | 2 | 2 | U |
| 200.8 | 03/04/10 | 200.8 | 03/24/10 | 7439-92-1 | Lead | 1 | 1 | U |
| 6010B | 03/04/10 | 6010B | 03/10/10 | 7440-22-4 | Silver | 3 | 3 | U |
| 6010B | 03/04/10 | 6010B | 03/10/10 | 7440-66-6 | Zinc | 10 | 20 | |

U-Analyte undetected at given RL

RL-Reporting Limit


INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS
Page 1 of 1

Sample ID: LAB CONTROL

Lab Sample ID: QM43LCS

LIMS ID: 10-5291

Matrix: Water

Data Release Authorized: 

Reported: 03/25/10

QC Report No: QM43-The Boeing Company

Project: Boeing Plant 2 source Control

Date Sampled: NA

Date Received: NA

BLANK SPIKE QUALITY CONTROL REPORT

| Analyte | Analysis Method | Spike Found | Spike Added | % Recovery | Q |
|----------|-----------------|-------------|-------------|------------|---|
| Arsenic | 200.8 | 25.3 | 25.0 | 101% | |
| Cadmium | 6010B | 499 | 500 | 99.8% | |
| Chromium | 6010B | 477 | 500 | 95.4% | |
| Copper | 6010B | 472 | 500 | 94.4% | |
| Lead | 200.8 | 26 | 25 | 104% | |
| Silver | 6010B | 507 | 500 | 101% | |
| Zinc | 6010B | 500 | 500 | 100% | |

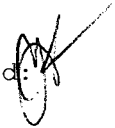
Reported in µg/L

N-Control limit not met

Control Limits: 80-120%

INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS
Page 1 of 1

Sample ID: METHOD BLANK

Lab Sample ID: QM43MB
LIMS ID: 10-5291
Matrix: Water
Data Release Authorized: 
Reported: 03/25/10

QC Report No: QM43-The Boeing Company
Project: Boeing Plant 2 source Control
Date Sampled: NA
Date Received: NA


| Prep Meth | Prep Date | Analysis Method | Analysis Date | CAS Number | Analyte | RL | µg/L | Q |
|-----------|-----------|-----------------|---------------|------------|----------|-----|------|---|
| 200.8 | 03/04/10 | 200.8 | 03/24/10 | 7440-38-2 | Arsenic | 0.2 | 0.2 | U |
| 6010B | 03/04/10 | 6010B | 03/10/10 | 7440-43-9 | Cadmium | 2 | 2 | U |
| 6010B | 03/04/10 | 6010B | 03/10/10 | 7440-47-3 | Chromium | 5 | 5 | U |
| 6010B | 03/04/10 | 6010B | 03/10/10 | 7440-50-8 | Copper | 2 | 2 | U |
| 200.8 | 03/04/10 | 200.8 | 03/24/10 | 7439-92-1 | Lead | 1 | 1 | U |
| 6010B | 03/04/10 | 6010B | 03/10/10 | 7440-22-4 | Silver | 3 | 3 | U |
| 6010B | 03/04/10 | 6010B | 03/10/10 | 7440-66-6 | Zinc | 10 | 10 | U |

U-Analyte undetected at given RL
RL-Reporting Limit

MERCURY ANALYSIS

INORGANICS ANALYSIS DATA SHEET
Dissolved Mercury by Method SW7470A



Data Release Authorized: 
Reported: 03/09/10
Date Received: 03/03/10
Page 1 of 1

QC Report No: QM45-The Boeing Company
Project: Boeing Plant 2 Source Control

| Client/ ARI ID | Date Sampled | Matrix | Prep Date Anal Date | RL | Result |
|-------------------|-----------------|--------|------------------------|------|--------|
| PL2SC-EB2-030310 | 03/03/10 | Water | 03/01/10 | 20.0 | 20.0 U |
| QM45A 10-5292 | | | 03/05/10 | | |
| MB-030110 | NA | Water | 03/01/10 | 20.0 | 20.0 U |
| Method Blank | | | 03/05/10 | | |

Reported in ng/L

RL-Analytical reporting limit
U-Undetected at reported detection limit

INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS
Page 1 of 1

Sample ID: LAB CONTROL

Lab Sample ID: QM45LCS
LIMS ID: 10-5292
Matrix: Water
Data Release Authorized
Reported: 03/09/10

QC Report No: QM45-The Boeing Company
Project: Boeing Plant 2 Source Control
Date Sampled: NA
Date Received: NA

BLANK SPIKE QUALITY CONTROL REPORT


| Analyte | Analysis Method | Spike Found | Spike Added | % Recovery | Q |
|---------|-----------------|-------------|-------------|------------|---|
| Mercury | 7470A | 195 | 200 | 97.5% | |

Reported in ng/L

N-Control limit not met
Control Limits: 80-120%

INORGANICS ANALYSIS DATA SHEET
Dissolved Mercury by Method SW7470A



Data Release Authorized: 
Reported: 03/02/10
Date Received: 02/26/10
Page 1 of 1

QC Report No: QL62-The Boeing Company
Project: BPS Source Control


| Client/ ARI ID | Date Sampled | Matrix | Prep Date Anal Date | RL | Result |
|-------------------|-----------------|--------|------------------------|------|--------|
| PL2SC-W-Z-022610 | 02/26/10 | Water | 02/26/10 | 20.0 | 20.0 U |
| QL62A 10-4825 | | | 03/01/10 | | |
| MB-022610 | NA | Water | 02/26/10 | 20.0 | 20.0 U |
| Method Blank | | | 03/01/10 | | |

Reported in ng/L

RL-Analytical reporting limit
U-Undetected at reported detection limit

INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS
Page 1 of 1

Sample ID: LAB CONTROL

Lab Sample ID: QL62LCS
LIMS ID: 10-4825
Matrix: Water
Data Release Authorized: 
Reported: 03/02/10

QC Report No: QL62-The Boeing Company
Project: BPS Source Control

Date Sampled: NA
Date Received: NA

BLANK SPIKE QUALITY CONTROL REPORT

| Analyte | Analysis Method | Spike Found | Spike Added | % Recovery | Q |
|---------|-----------------|-------------|-------------|------------|---|
| Mercury | 7470A | 187 | 200 | 93.5% | |


Reported in ng/L

N-Control limit not met
Control Limits: 80-120%

GENERAL CHEMISTRY ANALYSIS

SAMPLE RESULTS-CONVENTIONALS
QL59-The Boeing Company



Matrix: Water
Data Release Authorized: 
Reported: 03/01/10

Project: BP2 Source Control
Event: NA
Date Sampled: 02/26/10
Date Received: 02/26/10

Client ID: PL2SC-W-Z-022610
ARI ID: 10-4804 QL59A

| Analyte | Date Batch | Method | Units | RL | Sample |
|---------|----------------------|-----------|-----------|------|--------|
| pH | 02/26/10 022610#1 | EPA 150.1 | std units | 0.01 | 6.83 |

RL Analytical reporting limit
U Undetected at reported detection limit

REPLICATE RESULTS-CONVENTIONALS
QL59-The Boeing Company



Matrix: Water
Data Release Authorized
Reported: 03/01/10

A handwritten signature in black ink, appearing to be 'M. J.', written over the 'Data Release Authorized' text.

Project: BP2 Source Control
Event: NA
Date Sampled: 02/26/10
Date Received: 02/26/10

| Analyte | Method | Date | Units | Sample | Replicate(s) | RPD/RSD |
|---------|--------|------|-------|--------|--------------|---------|
|---------|--------|------|-------|--------|--------------|---------|


ARI ID: QL59A Client ID: PL2SC-W-Z-022610

| | | | | | | |
|----|-----------|----------|-----------|------|------|------|
| pH | EPA 150.1 | 02/26/10 | std units | 6.83 | 6.87 | 0.04 |
|----|-----------|----------|-----------|------|------|------|

pH is evaluated as the Absolute Difference between the values rather than
Relative Percent Difference

LAB CONTROL RESULTS-CONVENTIONALS
QL59-The Boeing Company



Matrix: Water
Data Release Authorized: 
Reported: 03/01/10

Project: BP2 Source Control
Event: NA
Date Sampled: NA
Date Received: NA

| Analyte/Method | QC ID | Date | Units | LCS | Spike Added | Recovery |
|-----------------|-------|----------|-----------|------|-------------|----------|
| pH EPA 150.1 | ICVL | 02/26/10 | std units | 7.03 | 7.00 | 0.03 |

pH is evaluated as the Absolute Difference between the values rather than Percent Recovery.

TOTAL SOLIDS

Solids Data Entry Report
Date: 03/09/10

Checked by: KM Date: 3/09/10
Data Analyst: DM

Solids Determination performed on 03/08/10 by MH

| JOB | SAMPLE | CLIENTID | TAREWEIGHT | SAMPDISH | DRYWEIGHT | SOLIDS |
|------|--------|---------------------|------------|----------|-----------|--------|
| QM32 | B | PL2SC-SS-Z-03032010 | 0.993 | 10.068 | 4.398 | 37.52 |



ARI Job No.: Qm 32

Client ID: The Boeing Company

Parameter: PCB

Client Project: BP2 Source Control

SOP Number(s):

No Anomalies:

List problems, concerns, corrective actions and any other pertinent information

Prep Time: 25mins (before drying) Prep time 20mins (After drying)

Wet Weight: 522.43g

Metals split: 20.97g

WC 3/3/10

Sample Dry Weight w/ Plastic Ring - 166.06g

Plastic Ring weight - 8.43g

Dry Weight without Plastic Ring - 157.63

WC 3/5/10

Sample was surrogate at 5X normal level to leave room for possible dilutions. ~~ST~~ 3/5/10

Sample "A" - black and viscous at approx 21-22mL after KD.

Took to 25mL in hexane and homogenized before taking

a 5mL split for cleanup. Used (2) high-volume acid

cleanups (6 p.p.t.s each) before transferring for sulfur clean.

SP 3/8/10

Analyst Initials:

Date:



Analytical Resources, Incorporated
Analytical Chemists and Consultants

April 15, 2010

Kent Angelos
Golder Associates, Inc.
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

RE: Boeing Plant 2 Source Control
ARI ID: Q078

Dear Kent:

Please find enclosed the original Chain-of-Custody (COC) records, sample receipt documentation, and the final data package for the project referenced above.

Sample receipt information and analytical details are addressed in the Case Narrative.

An electronic copy of this package will be kept on file at ARI. If you have any questions or require additional information, please contact me at your convenience.

Sincerely,
ANALYTICAL RESOURCES, INC.

Kelly Bottem
Client Services Manager
(206) 695-6211
kellyb@arilabs.com
www.arilabs.com

KB/eb

cc: Kent Angelos, Golder Associates Inc., 18300 NE Union Hill Road, Suite 200, Redmond, WA 98052-3333

Chain of Custody
Documentation

prepared
for

The Boeing Company

Project: BP2 Source Control,

ARI JOB NO: QO78

prepared
by

Analytical Resources, Inc.

Analytical Resources, Incorporated
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)

| | |
|--|-------------------------------|
| ARI Assigned Number: Q213 | Turn-around Requested: Std |
| ARI Client Company: Boeing | Phone: |
| Client Contact: Will Ernst | |
| Client Project Name: BPA Source Control | |
| Client Project #: | Samplers: LS |

[illegible]

| | | |
|-------------------------------|---------------------------------|-----------------------------|
| Comments/Special Instructions | Relinquished by: (Signature) | Received by: (Signature) |
| SMS metals as per OAPP | Elizabeth Shee | Ted |
| | Printed Name: | Printed Name: |
| | Liz Shee | Ted |
| | Company: | Company: |
| | Golden | Golden |
| | Date & Time: | Date & Time: |
| | 3/9/2010 1550 | 3/9/2010 |

Limits of Liability: ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.



Cooler Receipt Form

ARI Client: Boeing

Project Name: BP2 Source Control

COC No(s): NA

Delivered by: Fed-Ex UPS Courier Hand Delivered Other: _____

Assigned ARI Job No: Q213

Tracking No: _____ NA

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to cooler? YES NO

Were custody papers included with the cooler? YES YES NO

Were custody papers properly filled out (ink, signed, etc.) YES YES NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry)..... Amb

If cooler temperature is out of compliance fill out form 00070F Temp Gun ID#: N/A

Cooler Accepted by: JP Date: 3/9/10 Time: 1614

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler? YES NO

What kind of packing material was used? ... Bubble Wrap Wet Ice Gel Packs Baggies Foam Block Paper Other: _____

Was sufficient ice used (if appropriate)? NA YES NO

Were all bottles sealed in individual plastic bags? YES YES NO

Did all bottles arrive in good condition (unbroken)? YES YES NO

Were all bottle labels complete and legible? YES YES NO

Did the number of containers listed on COC match with the number of containers received? YES YES NO

Did all bottle labels and tags agree with custody papers? YES YES NO

Were all bottles used correct for the requested analyses? YES YES NO

Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)... NA YES NO

Were all VOC vials free of air bubbles? NA YES NO

Was sufficient amount of sample sent in each bottle? YES YES NO

Date VOC Trip Blank was made at ARI..... NA

Was Sample Split by ARI: NA YES Date/Time: _____ Equipment: _____ Split by: _____

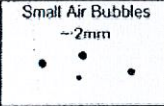
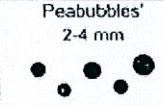
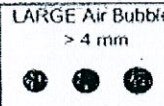
Samples Logged by: JP Date: 3/10/10 Time: 1200

**** Notify Project Manager of discrepancies or concerns ****

| Sample ID on Bottle | Sample ID on COC | Sample ID on Bottle | Sample ID on COC |
|---------------------|------------------|---------------------|------------------|
| | | | |
| | | | |
| | | | |
| | | | |

Additional Notes, Discrepancies, & Resolutions:

By: _____ Date: _____

| | | | |
|---|---|---|-------------------|
|  |  |  | Small → "sm" |
| | | | Peabubbles → "pb" |
| | | | Large → "lg" |
| | | | Headspace → "hs" |



Cooler Temperature Compliance Form

| | | | |
|-----------------------|--------------|------------------|-----|
| Cooler#: | 1 | Temperature(°C): | Amb |
| Sample ID | Bottle Count | Bottle Type | |
| PL2SL-SS-J505A-030910 | 1 | Filter Bag | |
| PL2SL-BE1-030910 | 1 | 80Z WMLG | |
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|-----------|--------------|------------------|--|
| Cooler#: | | Temperature(°C): | |
| Sample ID | Bottle Count | Bottle Type | |
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|-----------|--------------|------------------|--|
| Cooler#: | | Temperature(°C): | |
| Sample ID | Bottle Count | Bottle Type | |
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|-----------|--------------|------------------|--|
| Cooler#: | | Temperature(°C): | |
| Sample ID | Bottle Count | Bottle Type | |
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| | | | |

Completed by: _____ Date: _____ Time: _____

Case Narrative

prepared
for

The Boeing Company

Project: BP2 Source Control,

ARI JOB NO: QO78

prepared
by

Analytical Resources, Inc.



Case Narrative

Project: Boeing Plant 2 Source Control

ARI ID: QO78

Matrix: Filter Bag / Solid

Date: April 15, 2010

Sample Receipt Information

Two solid matrix samples were received in good condition at ARI on 03/09/10 under ARI sample delivery group QO78. One cooler arrived at an ambient temperature.

Select samples were analyzed for the parameters listed below, as requested on the COC.

PCBs by Method 8082:

The sample was extracted on 3/22/10 and analyzed on 3/22/10 and 3/26/10 - within the method recommended holding times.

Initial calibration (s): All analytes of interest were within method acceptance criteria.

Continuing calibration (s): Are in control.

Internal Standard (s): Are in control.

Samples: There were no anomalies associated with these samples.

Surrogates: All surrogate recoveries were in control.

LCS(s): All percent recoveries for the analytes of interest were within compliance.

Method Blank: The method blank was free of contamination.

Total Metals by Methods 6010B, 200.8, and 7471A

The samples were digested on 3/22/10. The digests were analyzed between 3/25/10 and 4/12/10 - within the method recommended holding times.

Samples: No anomalies were encountered for these samples.

LCS/Blank Spike(s): All percent recoveries were within compliance.

Method Blank(s): Are in control.

Standard Reference: All percent recoveries were within compliance.



Data Reporting Qualifiers

Effective 7/10/2009

Inorganic Data

- U Indicates that the target analyte was not detected at the reported concentration
- * Duplicate RPD is not within established control limits
- B Reported value is less than the CRDL but \geq the Reporting Limit
- N Matrix Spike recovery not within established control limits
- NA Not Applicable, analyte not spiked
- H The natural concentration of the spiked element is so much greater than the concentration spiked that an accurate determination of spike recovery is not possible
- L Analyte concentration is ≤ 5 times the Reporting Limit and the replicate control limit defaults to ± 1 RL instead of the normal 20% RPD

Organic Data

- U Indicates that the target analyte was not detected at the reported concentration
- * Flagged value is not within established control limits
- B Analyte detected in an associated Method Blank at a concentration greater than one-half of ARI's Reporting Limit or 5% of the regulatory limit or 5% of the analyte concentration in the sample.
- J Estimated concentration when the value is less than ARI's established reporting limits
- D The spiked compound was not detected due to sample extract dilution
- E Estimated concentration calculated for an analyte response above the valid instrument calibration range. A dilution is required to obtain an accurate quantification of the analyte.
- Q Indicates a detected analyte with an initial or continuing calibration that does not meet established acceptance criteria ($<20\%$ RSD, $<20\%$ Drift or minimum RRF).
- S Indicates an analyte response that has saturated the detector. The calculated concentration is not valid; a dilution is required to obtain valid quantification of the analyte



- NA The flagged analyte was not analyzed for
- NR Spiked compound recovery is not reported due to chromatographic interference
- NS The flagged analyte was not spiked into the sample
- M Estimated value for an analyte detected and confirmed by an analyst but with low spectral match parameters. This flag is used only for GC-MS analyses
- M2 The sample contains PCB congeners that do not match any standard Aroclor pattern. The PCBs are identified and quantified as the Aroclor whose pattern most closely matches that of the sample. The reported value is an estimate.
- N The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification"
- Y The analyte is not detected at or above the reported concentration. The reporting limit is raised due to chromatographic interference. The Y flag is equivalent to the U flag with a raised reporting limit.
- C The analyte was positively identified on only one of two chromatographic columns. Chromatographic interference prevented a positive identification on the second column
- P The analyte was detected on both chromatographic columns but the quantified values differ by $\geq 40\%$ RPD with no obvious chromatographic interference

Geotechnical Data

- A The total of all fines fractions. This flag is used to report total fines when only sieve analysis is requested and balances total grain size with sample weight.
- F Samples were frozen prior to particle size determination
- SM Sample matrix was not appropriate for the requested analysis. This normally refers to samples contaminated with an organic product that interferes with the sieving process and/or moisture content, porosity and saturation calculations
- SS Sample did not contain the proportion of "fines" required to perform the pipette portion of the grain size analysis
- W Weight of sample in some pipette aliquots was below the level required for accurate weighting

SURR SOLUTIONS

3/6/2010

| LABEL | SOLN ID | TEST | CONC. UG/ML | SOLVENT | EXP. |
|----------------------|---------|------------|-------------|---------|----------|
| A | 1662-3 | ABN | 100/150 | MEOH | 10/08/10 |
| B | 1633-3 | SIM PNA | 15/75 | MEOH | 08/12/10 |
| C* | 1559-1 | SIM ABN | 25/37.5 | MEOH | 03/13/10 |
| D | 1689-2 | LOW PCB | 0.2 | ACETONE | 12/29/10 |
| E | 1661-2 | HERB | 62.5 | MEOH | 10/02/10 |
| F | 1683-3 | PCP | 12.5 | ACETONE | 12/09/10 |
| G* | 1534-1 | 1,4DIOXANE | 100 | MEOH | 02/20/10 |
| H | 1594-1 | OP-PEST | 25 | MEOH | 04/01/10 |
| I | 1634-1 | LOW S. PNA | 1.5 | MEOH | 08/12/10 |
| J | 1681-2 | TBT-PORE | 0.125 | MECL2 | 12/01/10 |
| K | 1689-1 | MED PCB | 20 | ACETONE | 12/29/10 |
| L | 1681-1 | TBT | 2.5 | MECL2 | 12/01/10 |
| M | 1682-1 | EPH | 1500 | MECL2 | 09/17/10 |
| N | 1689-3 | PCB | 2 | ACETONE | 12/29/10 |
| O | 1699-1 | TPH | 450 | MECL2 | 07/02/10 |
| P | 1666-3 | HCID | 2250 | MECL2 | 05/06/10 |
| Q | 1620-2 | EDB | 1 | MEOH | 06/22/10 |
| R | 1615-1 | RESIN ACID | 250 | ACETONE | 06/17/10 |
| S# | 1568-5 | PBDE | .25 | MEOH | NA |
| T | 1674-2 | ALKYL PNA | 10 | MEOH | 07/30/10 |
| U | 1633-1 | CONGENER | 2.5 | ACETONE | 08/11/10 |
| V | | | | | |
| *reverified solution | | | | | |
| #project specific | | | | | |
| Y | | | | | |
| Z | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

LCS SOLUTIONS

3/6/2010

| LABL | SOLN ID | TEST | CONC. UG/ML | SOLVENT | EXP. |
|------|---------|--------------|-------------|---------|----------|
| 1 | 1686-1 | PCB 1660 | 20 | ACETONE | 09/01/10 |
| 2# | 1472-3 | BCOC PEST | 10 | ACETONE | NA |
| 3 | 1620-4 | PEST | 02/04/20 | ACETONE | 06/26/10 |
| 4 | 1667-1 | LOW PEST | 0.2/0.4/2 | ACETONE | 06/26/10 |
| 5 | 1677-1 | EPH | 1500 | MECL2 | 11/12/10 |
| 6 | 1702-2 | PCP | 12.5/125 | ACETONE | 02/18/11 |
| 7 | 1705-1 | ABN | 100 | ACETONE | 07/01/10 |
| 8 | 1681-4 | TBT | 2.5 | MECL2 | 12/01/10 |
| 9 | 1682-2 | PORE TBT | .125/.25 | MECL2 | 12/01/10 |
| 10 | 1698-2 | ABN ACID | 100/200 | MECL2 | 07/14/10 |
| 11 | 1642-2 | TPHD | 15000 | ACETONE | 09/07/10 |
| 12 | 1698-1 | ABN BASE | 200 | MEOH | 07/24/10 |
| 13 | 1613-1 | LOW PCB | 2 | ACETONE | 06/08/10 |
| 14* | 1547-1 | LOW ABN ACID | 10/20 | MEOH | 04/10/10 |
| 15* | 1591-3 | SIM PNA | 15/75 | MEOH | 08/28/10 |
| 16 | 1602-3 | DIOXANE | 100 | MEOH | 03/20/10 |
| 17 | 1644-1 | 1248 PCB | 10 | ACETONE | 09/10/10 |
| 18* | 1591-4 | LOW SIM PNA | 1.5 | ACETONE | 08/28/10 |
| 19 | 1685-3 | AK103 | 7500 | ACETONE | 09/03/10 |
| 20 | 1682-4 | PNA | 100 | ACETONE | 12/04/10 |
| 21 | 1593-3 | SKY/BHT | 100 | MEOH | 03/31/10 |
| 22 | 1702-4 | HERB | 12.5/12500 | MEOH | 04/17/10 |
| 23* | 1505-1 | LW ABN BASE | 20 | MEOH | 03/20/10 |
| 24 | 1696-1 | LOW ABN | 10 | ACETONE | 01/13/11 |
| 25# | 1481-1 | DIPHENYL | 100 | MEOH | NA |
| 26 | 1702-5 | OP-PEST | 25 | MEOH | 03/31/10 |
| 27 | 1668-3 | STEROLS | 200 | MEOH | 10/30/10 |
| 28# | 1684-1 | ADD. PEST | 4 | ACETONE | 03/25/10 |
| 29# | 1496-3 | DECANES | 100 | MEOH | NA |
| 30 | 1620-1 | EDB/DBCP | 0.2 | MEOH | 06/22/10 |

LCS SOLUTIONS

3/6/2010

| | | | | | |
|-----------------------------|--------|-------------|--------|---------|----------|
| 31 | 1596-1 | TERPINEOL | 100 | MEOH | 04/03/10 |
| 32 | 1619-3 | GUAIACOL | 50-200 | ACETONE | 04/30/10 |
| 33 | 1639-3 | RETENE | 100 | MEOH | 09/03/10 |
| 34 | 1633-1 | CONGENERS | 2.5 | ACETONE | 08/11/10 |
| 35 | 1674-3 | ALKYL PNA A | 10 | MEOH | 10/28/10 |
| 36 | 1601-3 | ALKYL PNA B | 10 | MEOH | 05/13/10 |
| 50 | 1617-1 | FULL RESIN | 250 | ACETONE | 06/17/10 |
| 51 | 1696-3 | DDTS | 2.5 | ACETONE | 06/03/10 |
| 52 | 1613-5 | 1232 PCB | 20 | ACETONE | 06/16/10 |
| 53 | 1703-3 | DALAPON | 50 | MEOH | 09/11/10 |
| 54 | 1701-2 | PBDE | 0.5 | ACETONE | 02/10/11 |
| #=PROJECT SPECIFIC SOLUTION | | | | | |
| *=REVERIFIED SOLUTION | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |



Spike Recovery Control Limits - Analysis of PCB / Aroclors in Soil & Sediment Samples - EPA SW-846 Method 8082

Effective 5/1/09

Control limits are updated periodically. Assure that you have ARI's current control limits by downloading the files at the time of use. <http://www.arilabs.com/portal/downloads/ARI-CLs.zip>

| | Routine Analysis | PSDDA | Low Level | Low level | Soxhlet Extraction | Medium Level |
|--|------------------|----------|-----------------|-----------|-----------------------|--------------|
| Typical Reporting Limit (µg/kg): | 33 | 20 | 10 | 4 | 100 | 800 |
| Nominal Sample Wet Weight (g): | 12 | 25 | 25 | 25 | 10 | 5 |
| Final Extract Volume (mL): | 4 | 5 | 2.5 | 1 | 10 | 40 |
| LCS Spike Recovery ^(1,2) | | | | | | |
| Aroclor 1016 | 48 - 106 | 52 - 101 | 53 - 100 | 37 - 106 | 30 - 160 ³ | 59 - 108 |
| Aroclor 1260 | 50 - 121 | 52 - 126 | 58 - 112 | 50 - 116 | 30 - 160 ³ | 43 - 177 |
| | | | | | | |
| Method Blank / LCS Surrogate Recovery | | | | | | |
| Tetrachloro- <i>meta</i> -xylene (TCMX) | 46 - 111 | 47 - 110 | 43 - 108 | 35 - 100 | 30 - 160 ³ | 49 - 110 |
| Decachlorobiphenyl | 51 - 112 | 48 - 119 | 48 - 118 | 40 - 109 | 30 - 160 ³ | 51 - 127 |
| | | | | | | |
| Sample Surrogate Recovery | | | | | | |
| Tetrachloro- <i>meta</i> -xylene (TCMX) | 50 - 114 | 46 - 113 | 35 - 119 | 38 - 102 | 30 - 160 ³ | 28 - 106 |
| Decachlorobiphenyl | 42 - 127 | 40 - 130 | 33 - 143 | 34 - 141 | 30 - 160 ³ | 22 - 168 |

(1) Laboratory Control Sample (LCS) spike recovery control limits also used as advisory control limits for sample matrix spike (MS) analyzes. MS recovery values are advisory and not used to assess the acceptability of an analytical batch.

(2) Highlighted control limits (**bold font**) adjusted to demonstrate that ARI does not use control limits < 10 for the lower limit or < 100 for the upper limit.

(3) 30 – 160 are default, advisory control limits used when there is insufficient data to calculate historic control limits. **DO NOT** use these limits as the sole reason to reject the data from a batch of analyses.



Summary of Laboratory Control Limits

Default limits of 30-160% recovery and 30% RPD apply for all organic analytes when laboratory generated control limits are not available on ARI's web site. Default limits for all inorganic analytes are 75-125% recovery and 25% RPD.

ARI's laboratory generated Quality Control Limits may be superseded by project specific data quality objectives (DQO) provided by ARI's clients. The use of project specific DQO must be approved by ARI's Laboratory and QA Program Managers.



Summary of Laboratory Control Limits Metals Analyses (All Methods & Sample Matrices)

Effective 5/1/09

Control limits are updated periodically. Assure that you have ARI's current control limits by downloading the files at the time of use. <http://www.arilabs.com/portal/downloads/ARI-CLs.zip>

| Element | Matrix Spike Recovery | LCS Recovery | Replicate RPD |
|-----------|-----------------------|--------------|---------------|
| Aluminum | 75 - 125 | 80 - 120 | ≤ 20% |
| Antimony | 75 - 125 | 80 - 120 | ≤ 20% |
| Arsenic | 75 - 125 | 80 - 120 | ≤ 20% |
| Barium | 75 - 125 | 80 - 120 | ≤ 20% |
| Beryllium | 75 - 125 | 80 - 120 | ≤ 20% |
| Boron | 75 - 125 | 80 - 120 | ≤ 20% |
| Cadmium | 75 - 125 | 80 - 120 | ≤ 20% |
| Calcium | 75 - 125 | 80 - 120 | ≤ 20% |
| Chromium | 75 - 125 | 80 - 120 | ≤ 20% |
| Cobalt | 75 - 125 | 80 - 120 | ≤ 20% |
| Copper | 75 - 125 | 80 - 120 | ≤ 20% |
| Iron | 75 - 125 | 80 - 120 | ≤ 20% |
| Lead | 75 - 125 | 80 - 120 | ≤ 20% |
| Magnesium | 75 - 125 | 80 - 120 | ≤ 20% |
| Manganese | 75 - 125 | 80 - 120 | ≤ 20% |
| Mercury | 75 - 125 | 80 - 120 | ≤ 20% |
| Nickel | 75 - 125 | 80 - 120 | ≤ 20% |
| Potassium | 75 - 125 | 80 - 120 | ≤ 20% |
| Selenium | 75 - 125 | 80 - 120 | ≤ 20% |
| Silica | 75 - 125 | 80 - 120 | ≤ 20% |
| Silver | 75 - 125 | 80 - 120 | ≤ 20% |
| Sodium | 75 - 125 | 80 - 120 | ≤ 20% |
| Strontium | 75 - 125 | 80 - 120 | ≤ 20% |
| Thallium | 75 - 125 | 80 - 120 | ≤ 20% |
| Vanadium | 75 - 125 | 80 - 120 | ≤ 20% |
| Zinc | 75 - 125 | 80 - 120 | ≤ 20% |

Data Summary Package

prepared
for

The Boeing Company

Project: BP2 Source Control,

ARI JOB NO: QO78

prepared
by

Analytical Resources, Inc.

PCB ANALYSIS


ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082
Page 1 of 1

Sample ID: PL2SC-SS-J505A-030910
SAMPLE

Lab Sample ID: Q078A

LIMS ID: 10-7121

Matrix: Filter

Data Release Authorized: 

Reported: 03/29/10

QC Report No: Q078-The Boeing Company

Project: BP2 Source Control

Date Sampled: 03/09/10

Date Received: 03/18/10

Date Extracted: 03/22/10

Date Analyzed: 03/26/10 08:23

Instrument/Analyst: ECD5/JGR

GPC Cleanup: No

Sulfur Cleanup: Yes

Acid Cleanup: Yes

Sample Amount: 1.00 Filter

Final Extract Volume: 10 mL

Dilution Factor: 10.0

Silica Gel: Yes

| CAS Number | Analyte | RL | Result |
|------------|--------------|-----|---------|
| 12674-11-2 | Aroclor 1016 | 2.0 | < 2.0 U |
| 53469-21-9 | Aroclor 1242 | 2.0 | 18 |
| 12672-29-6 | Aroclor 1248 | 2.0 | < 2.0 U |
| 11097-69-1 | Aroclor 1254 | 2.0 | 56 P |
| 11096-82-5 | Aroclor 1260 | 2.0 | 73 |
| 11104-28-2 | Aroclor 1221 | 2.0 | < 2.0 U |
| 11141-16-5 | Aroclor 1232 | 2.0 | < 2.0 U |

Reported in Total μ g

PCB Surrogate Recovery

| | |
|-----------------------|-------|
| Decachlorobiphenyl | 110% |
| Tetrachlorometaxylene | 93.6% |

SW8082/PCB SURROGATE RECOVERY SUMMARY

Matrix: Filter

QC Report No: Q078-The Boeing Company
Project: BP2 Source Control


| Client ID | DCBP | TCMX | TOT OUT |
|-----------------------|-------|-------|---------|
| MB-032210 | 84.5% | 69.5% | 0 |
| LCS-032210 | 85.5% | 77.2% | 0 |
| LCSD-032210 | 93.2% | 76.8% | 0 |
| PL2SC-SS-J505A-030910 | 110% | 93.6% | 0 |

| | LCS/MB LIMITS | QC LIMITS |
|--------------------------------|---------------|-----------|
| (DCBP) = Decachlorobiphenyl | (30-160) | (30-160) |
| (TCMX) = Tetrachlorometaxylene | (30-160) | (30-160) |

Prep Method: SW3580A
Log Number Range: 10-7121 to 10-7121

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082
Page 1 of 1

Sample ID: LCS-032210
LCS/LCSD

Lab Sample ID: LCS-032210
LIMS ID: 10-7121
Matrix: Filter
Data Release Authorized: 
Reported: 03/29/10

QC Report No: Q078-The Boeing Company
Project: BP2 Source Control

Date Sampled: 03/09/10
Date Received: 03/18/10

Date Extracted LCS/LCSD: 03/22/10

Sample Amount LCS: 1.00 Filter
LCSD: 1.00 Filter

Date Analyzed LCS: 03/26/10 09:27
LCSD: 03/26/10 09:49

Final Extract Volume LCS: 5.0 mL
LCSD: 5.0 mL

Instrument/Analyst LCS: ECD5/JGR
LCSD: ECD5/JGR

Dilution Factor LCS: 1.00
LCSD: 1.00

GPC Cleanup: No
Sulfur Cleanup: Yes

Silica Gel: Yes
Acid Cleanup: Yes

| Analyte | Spike | | LCS | | Spike | | LCSD | | RPD |
|--------------|-------|-----------|----------|------|------------|----------|-------|-----|-----|
| | LCS | Added-LCS | Recovery | LCSD | Added-LCSD | Recovery | LCSD | RPD | |
| Aroclor 1016 | 2.7 | 2.5 | 108% | 2.9 | 2.5 | 116% | 7.1% | | |
| Aroclor 1260 | 2.3 | 2.5 | 92.0% | 2.6 | 2.5 | 104% | 12.2% | | |

PCB Surrogate Recovery

| | LCS | LCSD |
|-----------------------|-------|-------|
| Decachlorobiphenyl | 85.5% | 93.2% |
| Tetrachlorometaxylene | 77.2% | 76.8% |

Reported in Total μ g
RPD calculated using sample concentrations per SW846.

4
PCB METHOD BLANK SUMMARY

BLANK NO.

QO78MB1

Lab Name: ANALYTICAL RESOURCES, INC

Client: THE BOEING COMPANY

ARI Job No.: QO78

Project: BP2 SOURCE CONTROL

Lab Sample ID: QO78MB1

Lab File ID: 0326A011

Date Extracted: 03/22/10

Matrix: SOLID

Date Analyzed: 03/26/10

Instrument ID: ECD5

Time Analyzed: 0906

GC Columns: ZB5/ZB35


THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

| | CLIENT SAMPLE NO. | LAB SAMPLE ID | DATE ANALYZED |
|----|----------------------|------------------|------------------|
| | ===== | ===== | ===== |
| 01 | PL2SC-SS-J505A-0309 | QO78A | 03/26/10 |
| 02 | QO78LCS1 | QO78LCS1 | 03/26/10 |
| 03 | QO78LCSD1 | QO78LCSD1 | 03/26/10 |

ALL RUNS ARE DUAL COLUMN

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082
Page 1 of 1

Sample ID: MB-032210
METHOD BLANK

Lab Sample ID: MB-032210
LIMS ID: 10-7121
Matrix: Filter
Data Release Authorized: 
Reported: 03/29/10

QC Report No: Q078-The Boeing Company
Project: BP2 Source Control

Date Sampled: NA
Date Received: NA

Date Extracted: 03/22/10
Date Analyzed: 03/26/10 09:06
Instrument/Analyst: ECD5/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes

Sample Amount: 1.00 Filter
Final Extract Volume: 5.0 mL
Dilution Factor: 1.00
Silica Gel: Yes

| CAS Number | Analyte | RL | Result |
|------------|--------------|-----|---------|
| 12674-11-2 | Aroclor 1016 | 0.1 | < 0.1 U |
| 53469-21-9 | Aroclor 1242 | 0.1 | < 0.1 U |
| 12672-29-6 | Aroclor 1248 | 0.1 | < 0.1 U |
| 11097-69-1 | Aroclor 1254 | 0.1 | < 0.1 U |
| 11096-82-5 | Aroclor 1260 | 0.1 | < 0.1 U |
| 11104-28-2 | Aroclor 1221 | 0.1 | < 0.1 U |
| 11141-16-5 | Aroclor 1232 | 0.1 | < 0.1 U |

Reported in Total μ g

PCB Surrogate Recovery

| | |
|-----------------------|-------|
| Decachlorobiphenyl | 84.5% |
| Tetrachlorometaxylene | 69.5% |

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082
Page 1 of 1

Sample ID: PL2SC-BE1-030910
SAMPLE

Lab Sample ID: QO78C

QC Report No: QO78-The Boeing Company

LIMS ID: 10-7123

Project: BP2 Source Control

Matrix: Solid

Data Release Authorized: *JB*

Date Sampled: 03/09/10

Reported: 03/26/10

Date Received: 03/18/10

Date Extracted: 03/22/10

Sample Amount: 12.5 g-dry-wt

Date Analyzed: 03/23/10 02:13

Final Extract Volume: 4.0 mL

Instrument/Analyst: ECD5/JGR

Dilution Factor: 5.00

GPC Cleanup: No

Silica Gel: No

Sulfur Cleanup: Yes

Percent Moisture: 13.2%

Acid Cleanup: Yes

Florisil Cleanup: No

| CAS Number | Analyte | RL | Result |
|------------|--------------|----|--------|
| 12674-11-2 | Aroclor 1016 | 32 | < 32 U |
| 53469-21-9 | Aroclor 1242 | 32 | < 32 U |
| 12672-29-6 | Aroclor 1248 | 32 | < 32 U |
| 11097-69-1 | Aroclor 1254 | 32 | < 32 U |
| 11096-82-5 | Aroclor 1260 | 32 | < 32 U |
| 11104-28-2 | Aroclor 1221 | 32 | < 32 U |
| 11141-16-5 | Aroclor 1232 | 32 | < 32 U |

Reported in $\mu\text{g/kg}$ (ppb)

PCB Surrogate Recovery

| | |
|-----------------------|-------|
| Decachlorobiphenyl | 89.2% |
| Tetrachlorometaxylene | 69.8% |

SW8082/PCB SOIL/SEDIMENT SURROGATE RECOVERY SUMMARY

Matrix: Solid

QC Report No: QO78-The Boeing Company
Project: BP2 Source Control

| Client ID | DCBP % REC | DCBP LCL-UCL | TCMX % REC | TCMX LCL-UCL | TOT OUT |
|------------------|---------------|-----------------|---------------|-----------------|---------|
| MB-032210 | 75.2% | 30-160 | 70.5% | 30-160 | 0 |
| LCS-032210 | 76.0% | 30-160 | 71.5% | 30-160 | 0 |
| LCSD-032210 | 71.0% | 30-160 | 70.2% | 30-160 | 0 |
| PL2SC-BE1-030910 | 89.2% | 30-160 | 69.8% | 30-160 | 0 |

Microwave (MARS) Control Limits
Prep Method: SW3546
Log Number Range: 10-7123 to 10-7123

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082
Page 1 of 1

Sample ID: LCS-032210
LCS/LCSD

Lab Sample ID: LCS-032210
LIMS ID: 10-7123
Matrix: Solid
Data Release Authorized: *AB*
Reported: 03/26/10

QC Report No: Q078-The Boeing Company
Project: BP2 Source Control

Date Sampled: NA
Date Received: NA

Date Extracted LCS/LCSD: 03/22/10

Sample Amount LCS: 12.0 g-dry-wt
LCSD: 12.0 g-dry-wt

Date Analyzed LCS: 03/22/10 18:46
LCSD: 03/22/10 19:07

Final Extract Volume LCS: 4.0 mL
LCSD: 4.0 mL

Instrument/Analyst LCS: ECD5/JGR
LCSD: ECD5/JGR

Dilution Factor LCS: 1.00
LCSD: 1.00

GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Silica Gel: Yes

Percent Moisture: NA

| Analyte | Spike | | LCS | | Spike | | LCSD | | RPD |
|--------------|-------|-----------|----------|------|------------|----------|------|------------|------|
| | LCS | Added-LCS | Recovery | LCSD | Added-LCSD | Recovery | LCSD | Added-LCSD | |
| Aroclor 1016 | 182 | 167 | 109% | 174 | 167 | 104% | 174 | 167 | 4.5% |
| Aroclor 1260 | 147 | 167 | 88.2% | 137 | 167 | 82.2% | 137 | 167 | 7.0% |

PCB Surrogate Recovery

| | LCS | LCSD |
|-----------------------|-------|-------|
| Decachlorobiphenyl | 76.0% | 71.0% |
| Tetrachlorometaxylene | 71.5% | 70.2% |

Results reported in $\mu\text{g/kg}$ (ppb)
RPD calculated using sample concentrations per SW846.

4
PCB METHOD BLANK SUMMARY

BLANK NO.

QP11MBS1

Lab Name: ANALYTICAL RESOURCES, INC

Client: THE BOEING COMPANY

ARI Job No.: QO78

Project: BUILDING 3-322 SOIL

Lab Sample ID: QP11MBS1

Lab File ID: 0322A030

Date Extracted: 03/22/10

Matrix: SOLID

Date Analyzed: 03/22/10

Instrument ID: ECD5

Time Analyzed: 1824

GC Columns: ZB5/ZB35

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

| | CLIENT SAMPLE NO. ===== | LAB SAMPLE ID ===== | DATE ANALYZED ===== |
|----|-------------------------------|---------------------------|---------------------------|
| 01 | QP11LCSS1 | QP11LCSS1 | 03/22/10 |
| 02 | QP11LCSDS1 | QP11LCSDS1 | 03/22/10 |
| 03 | PL2SC-BE1-030910 | QO78C | 03/23/10 |

ALL RUNS ARE DUAL COLUMN

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082
Page 1 of 1

Sample ID: MB-032210
METHOD BLANK

Lab Sample ID: MB-032210
LIMS ID: 10-7123
Matrix: Solid
Data Release Authorized: *[Signature]*
Reported: 03/26/10

QC Report No: Q078-The Boeing Company
Project: BP2 Source Control

Date Sampled: NA
Date Received: NA

Date Extracted: 03/22/10
Date Analyzed: 03/22/10 18:24
Instrument/Analyst: ECD5/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 12.0 g
Final Extract Volume: 4.0 mL
Dilution Factor: 1.00
Silica Gel: Yes

Percent Moisture: NA

| CAS Number | Analyte | RL | Result |
|------------|--------------|-----|---------|
| 12674-11-2 | Aroclor 1016 | 6.7 | < 6.7 U |
| 53469-21-9 | Aroclor 1242 | 6.7 | < 6.7 U |
| 12672-29-6 | Aroclor 1248 | 6.7 | < 6.7 U |
| 11097-69-1 | Aroclor 1254 | 6.7 | < 6.7 U |
| 11096-82-5 | Aroclor 1260 | 6.7 | < 6.7 U |
| 11104-28-2 | Aroclor 1221 | 6.7 | < 6.7 U |
| 11141-16-5 | Aroclor 1232 | 6.7 | < 6.7 U |

Reported in $\mu\text{g/kg}$ (ppb)

PCB Surrogate Recovery

| | |
|-----------------------|-------|
| Decachlorobiphenyl | 75.2% |
| Tetrachlorometaxylene | 70.5% |

METALS ANALYSIS

INORGANICS ANALYSIS DATA SHEET

TOTAL METALS

Page 1 of 1

Sample ID: PL2SC-SS-J505A-030910
SAMPLE

Lab Sample ID: Q078B

LIMS ID: 10-7122

Matrix: Soil

Data Release Authorized:

Reported: 04/14/10

QC Report No: Q078-The Boeing Company

Project: BP2 Source Control

Date Sampled: 03/09/10

Date Received: 03/18/10

Percent Total Solids: 15.8%

| Prep Meth | Prep Date | Analysis Method | Analysis Date | CAS Number | Analyte | RL | mg/kg-dry | Q |
|-----------|-----------|-----------------|---------------|------------|----------|-----|-----------|---|
| 3050B | 03/22/10 | 200.8 | 04/12/10 | 7440-38-2 | Arsenic | 1 | 4 | |
| 3050B | 03/22/10 | 6010B | 04/06/10 | 7440-43-9 | Cadmium | 1 | 2 | |
| 3050B | 03/22/10 | 6010B | 04/06/10 | 7440-47-3 | Chromium | 3 | 146 | |
| 3050B | 03/22/10 | 6010B | 04/06/10 | 7440-50-8 | Copper | 1 | 350 | |
| 3050B | 03/22/10 | 200.8 | 04/12/10 | 7439-92-1 | Lead | 6 | 110 | |
| CLP | 03/22/10 | 7471A | 03/25/10 | 7439-97-6 | Mercury | 0.1 | 0.3 | |
| 3050B | 03/22/10 | 6010B | 04/06/10 | 7440-22-4 | Silver | 2 | 2 | U |
| 3050B | 03/22/10 | 6010B | 04/06/10 | 7440-66-6 | Zinc | 6 | 1,120 | |

U-Analyte undetected at given RL

RL-Reporting Limit

INORGANICS ANALYSIS DATA SHEET

TOTAL METALS

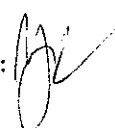
Page 1 of 1

Sample ID: PL2SC-BE1-030910
SAMPLE

Lab Sample ID: Q078C

LIMS ID: 10-7123

Matrix: Solid

Data Release Authorized: 

Reported: 04/14/10

QC Report No: Q078-The Boeing Company

Project: BP2 Source Control

Date Sampled: 03/09/10

Date Received: 03/18/10

Percent Total Solids: 87.2%

| Prep Meth | Prep Date | Analysis Method | Analysis Date | CAS Number | Analyte | RL | mg/kg-dry | Q |
|--------------|--------------|--------------------|------------------|------------|----------|------|-----------|---|
| 3050B | 03/22/10 | 200.8 | 04/12/10 | 7440-38-2 | Arsenic | 0.2 | 3.3 | |
| 3050B | 03/22/10 | 6010B | 04/06/10 | 7440-43-9 | Cadmium | 0.2 | 0.2 | U |
| 3050B | 03/22/10 | 6010B | 04/06/10 | 7440-47-3 | Chromium | 0.5 | 1.4 | |
| 3050B | 03/22/10 | 6010B | 04/06/10 | 7440-50-8 | Copper | 0.2 | 2.5 | |
| 3050B | 03/22/10 | 200.8 | 04/12/10 | 7439-92-1 | Lead | 1 | 26 | |
| CLP | 03/22/10 | 7471A | 03/25/10 | 7439-97-6 | Mercury | 0.02 | 0.02 | U |
| 3050B | 03/22/10 | 6010B | 04/06/10 | 7440-22-4 | Silver | 0.3 | 0.3 | U |
| 3050B | 03/22/10 | 6010B | 04/06/10 | 7440-66-6 | Zinc | 1 | 43 | |

U-Analyte undetected at given RL

RL-Reporting Limit

INORGANICS ANALYSIS DATA SHEET

TOTAL METALS

Page 1 of 1

Sample ID: LAB CONTROL

Lab Sample ID: Q078LCS

LIMS ID: 10-7122

Matrix: Soil

Data Release Authorized:

Reported: 04/14/10

QC Report No: Q078-The Boeing Company

Project: BP2 Source Control

Date Sampled: NA

Date Received: NA

BLANK SPIKE QUALITY CONTROL REPORT

| Analyte | Analysis Method | Spike Found | Spike Added | % Recovery | Q |
|----------|-----------------|-------------|-------------|------------|---|
| Arsenic | 200.8 | 25.4 | 25.0 | 102% | |
| Cadmium | 6010B | 51.0 | 50.0 | 102% | |
| Chromium | 6010B | 51.5 | 50.0 | 103% | |
| Copper | 6010B | 49.9 | 50.0 | 99.8% | |
| Lead | 200.8 | 26 | 25 | 104% | |
| Mercury | 7471A | 0.52 | 0.50 | 104% | |
| Silver | 6010B | 49.7 | 50.0 | 99.4% | |
| Zinc | 6010B | 48 | 50 | 96.0% | |

Reported in mg/kg-dry

N-Control limit not met

NA-Not Applicable, Analyte Not Spiked

Control Limits: 80-120%

INORGANICS ANALYSIS DATA SHEET

TOTAL METALS

Sample ID: METHOD BLANK

Page 1 of 1


Lab Sample ID: Q078MB

QC Report No: Q078-The Boeing Company

LIMS ID: 10-7122

Project: BP2 Source Control

Matrix: Soil

Data Release Authorized: 

Date Sampled: NA

Reported: 04/14/10

Date Received: NA

Percent Total Solids: NA

| Prep Meth | Prep Date | Analysis Method | Analysis Date | CAS Number | Analyte | RL | mg/kg-dry | Q |
|-----------|-----------|-----------------|---------------|------------|----------|------|-----------|---|
| 3050B | 03/22/10 | 200.8 | 04/12/10 | 7440-38-2 | Arsenic | 0.2 | 0.2 | U |
| 3050B | 03/22/10 | 6010B | 04/06/10 | 7440-43-9 | Cadmium | 0.2 | 0.2 | U |
| 3050B | 03/22/10 | 6010B | 04/06/10 | 7440-47-3 | Chromium | 0.5 | 0.5 | U |
| 3050B | 03/22/10 | 6010B | 04/06/10 | 7440-50-8 | Copper | 0.2 | 0.2 | U |
| 3050B | 03/22/10 | 200.8 | 04/12/10 | 7439-92-1 | Lead | 1 | 1 | U |
| CLP | 03/22/10 | 7471A | 03/25/10 | 7439-97-6 | Mercury | 0.02 | 0.02 | U |
| 3050B | 03/22/10 | 6010B | 04/06/10 | 7440-22-4 | Silver | 0.3 | 0.3 | U |
| 3050B | 03/22/10 | 6010B | 04/06/10 | 7440-66-6 | Zinc | 1 | 1 | U |

U-Analyte undetected at given RL

RL-Reporting Limit

TOTAL SOLIDS

Extractions Total Solids-extts
Data By: Rosie V. Rodriguez
Created: 3/20/10

Worklist: 9356
Analyst: RVR
Comments:

Oven ID: _____

Balance ID: _____

Samples In: Date: _____ Time: _____ Temp: _____ Analyst: _____

Samples Out: Date: _____ Time: _____ Temp: _____ Analyst: _____

| ARI ID CLIENT ID | Tare Wt (g) | Wet Wt (g) | Dry Wt (g) | % Solids | pH |
|---|----------------|---------------|---------------|----------|----|
| 1. QO78C 10-7123 PL2SC-BE1-030910 | 1.12 | 13.36 | 11.75 | 86.8 | NR |

Extractions Total Solids-extts
Data By: Rosie V. Rodriguez
Created: 3/20/10

Worklist: 9356
Analyst: RVR
Comments:

Oven ID: 015

Balance ID: MXX-612

Samples In: Date: 3/20/10 Time: 9:20 Temp: 95° Analyst: RR

Samples Out: Date: 3/22/10 Time: 4:30 Temp: 95° Analyst: RR

| ARI ID CLIENT ID | Tare Wt (g) | Wet Wt (g) | Dry Wt (g) | % Solids | pH |
|---------------------|----------------|---------------|---------------|----------|----|
|---------------------|----------------|---------------|---------------|----------|----|

| | | | | | |
|---|-------------|--------------|--------------|--|----|
| 1. Q078C 10-7123 PL2SC-BE1-030910 | <u>1.12</u> | <u>13.36</u> | <u>11.75</u> | | NR |
|---|-------------|--------------|--------------|--|----|



ARI Job No.: Q078

Client ID: The Boeing Company

Parameter: _____

Client Project: BP2 Source Control

SOP Number(s): _____

No Anomalies: ☐

List problems, concerns, corrective actions and any other pertinent information

Prep Time (before drying): 30 min ^{WW} 3/19/10 Prep Time (After drying) 30 mins ^{WC} 3/22/10

Sample Wet Weight A = 884.4g WW 3/19/10

Metals split A = 21.2g

A/B ~ Sample is a filter bag, Gray Slimy substance coats inside, pictures taken - WW 3/19/10

Sample Dry Weight w/ Plastic Ring. A = 206.39g

Plastic Ring Weight. A = 8.75g

Sample Dry Weight w/ Plastic ring removed. A = 198.04g

GC analyst, Sample 'A' was surrogate at 5x normal level to leave room for possible dilutions. ~~at~~ 3/22/10

A - taken to 10 mL FEU, 3 mL split for cleanups / in on SPE 1 mL to lab, High Volume acid clean ~ WW 3/25/10

Analyst Initials: _____

Date: _____

Solids Data Entry Report
Date: 03/23/10

Checked by: MH Date: 3/23/10
Data Analyst: KM

Solids Determination performed on 03/22/10 by MH

| JOB | SAMPLE | CLIENTID | TAREWEIGHT | SAMPDISH | DRYWEIGHT | SOLIDS |
|------|--------|---------------------|------------|----------|-----------|--------|
| QO78 | B | PL2SC-SS-J505A-0309 | 1.015 | 10.135 | 2.453 | 15.77 |
| QO78 | C | PL2SC-BE1-030910 | 0.983 | 10.195 | 9.013 | 87.17 |



Analytical Resources, Incorporated
Analytical Chemists and Consultants

April 27, 2010

Kent Angelos
Golder Associates, Inc.
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

RE: Boeing Plant 2 Source Control
ARI IDs: QQ02 / QQ03 / QQ28 / QQ32

Dear Kent:

Please find enclosed the original Chain-of-Custody (COC) records, sample receipt documentation, and the final data package for the project referenced above.

Sample receipt information and analytical details are addressed in the Case Narrative.

An electronic copy of this package will be kept on file at ARI. If you have any questions or require additional information, please contact me at your convenience.

Sincerely,
ANALYTICAL RESOURCES, INC.

Kelly Bottem
Client Services Manager
(206) 695-6211
kellyb@arilabs.com
www.arilabs.com

KB/eb

cc: Kent Angelos, Golder Associates Inc., 18300 NE Union Hill Road, Suite 200, Redmond, WA 98052-3333

Chain of Custody
Documentation

prepared
for

The Boeing Company

Project: Boeing Plant 2 Source Control,

ARI JOB NO: QQ02, QQ03, QQ28, QQ32

prepared
by

Analytical Resources, Inc.

Chain of Custody Record & Laboratory Analysis Request

Analytical Resources, Incorporated
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)

| | |
|-------------------|--------------------|
| Page: 1 | of 1 |
| Date: | Ice Present? Y |
| No. of Coolers: 1 | Cooler Temps: 13.0 |

| | |
|---|--|
| ARI Assigned Number: Q2002 | Turn-around Requested: Std |
| ARI Client Company: BOEING | Phone: |
| Client Contact: WILL ERNST | |
| Client Project Name: BOEING Plant 2 | Source Control |
| Client Project #: | Samplers: Liz Sheen, Kate M Pech |

[illegible]

Limits of Liability: ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.

0002 : 00003



ARI Job No: Q002

PC: Kelly
VTSR: 03/26/10

Inquiry Number:
Analysis Requested: 03/27/10
Contact: Ernst, Will
Client: The Boeing Company
Logged by: JP
Sample Set Used: Yes-376
Validatable Package: Yes
Deliverables:

Project #:
Project: Boeing Plant 2 Source Control
Sample Site:
SDG No:
Analytical Protocol: In-house

| LOGNUM ARI ID | CLIENT ID | CN | WAD | NH3 | COD | FOG | MET | PHEN | PHOS | TKN | NO23 | TOC | S2 | AK102/Fe2+ | DMET DOC FLT FLT | ADJUSTED TO | LOT NUMBER | AMOUNT ADDED | DATE/BY |
|------------------|------------------|-----|-----|-----|-----|-----|-----|------|------|-----|------|-----|----|------------|---------------------|----------------|---------------|-----------------|---------|
| 10-7888 Q002A | PL2SC-EB1-032610 | >12 | >12 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | >9 | <2 | | | | | |
| DIS | | | | | | | | | | | | | | | | | | | |
| PASS | | | | | | | | | | | | | | | | | | | |

Q002: 00004

Checked By JP Date 3/26/10



Cooler Receipt Form

ARI Client: Boeing

COC No(s): _____ (NA)

Assigned ARI Job No: QQ02

Project Name: Boeing Plant 2 Source Control

Delivered by: Fed-Ex UPS Courier Hand Delivered Other: _____

Tracking No: _____ (NA)

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to cooler? _____

YES (NO)

Were custody papers included with the cooler? _____

YES (NO)

Were custody papers properly filled out (ink, signed, etc.) _____

YES (NO)

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry) _____ 13.0

If cooler temperature is out of compliance fill out form 00070F

Temp Gun ID#: 909411d9

Cooler Accepted by: AV Date: 3/26/10 Time: 1339

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler? _____

YES (NO)

What kind of packing material was used? ... Bubble Wrap Wet Ice Gel Packs Baggies Foam Block Paper Other: _____

Was sufficient ice used (if appropriate)? _____

NA YES (NO)

Were all bottles sealed in individual plastic bags? _____

YES (NO)

Did all bottles arrive in good condition (unbroken)? _____

YES (NO)

Were all bottle labels complete and legible? _____

YES (NO)

Did the number of containers listed on COC match with the number of containers received? _____

YES (NO)

Did all bottle labels and tags agree with custody papers? _____

YES (NO)

Were all bottles used correct for the requested analyses? _____

YES (NO)

Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)...

NA YES (NO)

Were all VOC vials free of air bubbles? _____

NA YES (NO)

Was sufficient amount of sample sent in each bottle? _____

YES (NO)

Date VOC Trip Blank was made at ARI: _____

NA

Was Sample Split by ARI: NA YES Date/Time: _____ Equipment: _____ Split by: _____

Samples Logged by: JP Date: 3/26/10 Time: 1540

**** Notify Project Manager of discrepancies or concerns ****

| Sample ID on Bottle | Sample ID on COC | Sample ID on Bottle | Sample ID on COC |
|---------------------|------------------|---------------------|------------------|
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Additional Notes, Discrepancies, & Resolutions:

By: _____ Date: _____

| Small Air Bubbles ~2mm | Peabubbles 2-4 mm | LARGE Air Bubbles > 4 mm |
|---------------------------|----------------------|-----------------------------|
| | | |

| |
|-------------------|
| Small → "sm" |
| Peabubbles → "pb" |
| Large → "lg" |
| Headspace → "hs" |



Cooler Temperature Compliance Form

QQ02

| | | | |
|------------------|---|------------------|------------------------------|
| Cooler#: | 1 | Temperature(°C): | 13.0 |
| Sample ID | | Bottle Count | Bottle Type |
| PL2SC-EBI-032610 | | 4 | 32+160Z HDPE, 2-500 ml Amber |
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| Cooler#: | | Temperature(°C): | |
| Sample ID | | Bottle Count | Bottle Type |
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|-----------|--|------------------|-------------|
| Cooler#: | | Temperature(°C): | |
| Sample ID | | Bottle Count | Bottle Type |
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|-----------|--|------------------|-------------|
| Cooler#: | | Temperature(°C): | |
| Sample ID | | Bottle Count | Bottle Type |
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Completed by: JP Date: 3/26/10 Time: 1540

Chain of Custody Record & Laboratory Analysis Request

| | | |
|-------------------------------|-------------------------------|---|
| ARI Assigned Number: 68003 | Turn-around Requested: 5th | Page: 1 of 1 |
| ARI Client Company: BOEING | Phone: | Date: Ice Present? Y |
| Client Contact: WILL FRUST | | No. of Coolers: 1 Cooler Temps: 13.0 |

| | | |
|----------------------|----------------|-----------------------------------|
| Client Project Name: | Boeing Plant 2 | Source Control |
| Client Project #: | | Samplers: Liz Sheen, Kate M. Peak |

| Sample ID | Date | Time | Matrix | No. Containers |
|-----------|------|------|--------|----------------|
|-----------|------|------|--------|----------------|

[illegible]

| Comments/Special Instructions | Relinquished by: (Signature) | Received by: (Signature) |
|-------------------------------|---|---|
| SMS metals per QAPP | <i>L3 Sheen</i> Printed Name: L3 Sheen Company: <i>Golden</i> | <i>A-V</i> Printed Name: A-V Company: <i>AK</i> |
| | Date & Time: 3/26/10 1339 | Date & Time: 3/26/10 |

Limits of Liability: ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.



Cooler Receipt Form

ARI Client: Boeing

COC No(s): _____ (NA)

Assigned ARI Job No: Q003

Project Name: Plant 2 Source Control

Delivered by: Fed-Ex UPS Courier Hand Delivered Other: _____

Tracking No: _____ (NA)

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of cooler? YES (NO)

Were custody papers included with the cooler? YES NO

Were custody papers properly filled out (ink, signed, etc.) YES NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry) 13.6

If cooler temperature is out of compliance fill out form 00070F Temp Gun ID#: 909411d9

Cooler Accepted by: AV Date: 3/26/10 Time: 1339

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler? YES (NO)

What kind of packing material was used? ... Bubble Wrap Wet Ice Gel Packs Baggies Foam Block Paper Other: _____

Was sufficient ice used (if appropriate)? NA YES (NO)

Were all bottles sealed in individual plastic bags? YES (NO)

Did all bottles arrive in good condition (unbroken)? YES NO

Were all bottle labels complete and legible? YES NO

Did the number of containers listed on COC match with the number of containers received? YES NO

Did all bottle labels and tags agree with custody papers? YES NO

Were all bottles used correct for the requested analyses? YES NO

Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)... NA YES NO

Were all VOC vials free of air bubbles? (NA) YES NO

Was sufficient amount of sample sent in each bottle? YES NO

Date VOC Trip Blank was made at ARI: (NA)

Was Sample Split by ARI: (NA) YES Date/Time: _____ Equipment: _____ Split by: _____

Samples Logged by: JP Date: 3/26/10 Time: 1610

**** Notify Project Manager of discrepancies or concerns ****

| Sample ID on Bottle | Sample ID on COC | Sample ID on Bottle | Sample ID on COC |
|---------------------|------------------|---------------------|------------------|
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Additional Notes, Discrepancies, & Resolutions:

By: _____ Date: _____

| | | | |
|----------------------------------|-----------------------------|------------------------------------|-------------------|
| Small Air Bubbles ~2mm | Peabubbles 2-4 mm | LARGE Air Bubbles > 4 mm | Small → "sm" |
| | | | Peabubbles → "pb" |
| | | | Large → "lg" |
| | | | Headspace → "hs" |



Cooler Temperature Compliance Form

| | | | |
|------------------|---|------------------|-----------------------------|
| Cooler#: | 1 | Temperature(°C): | 3.0 |
| Sample ID | | Bottle Count | Bottle Type |
| PL2SC-EBI-032410 | | 4 | 32+16oz HDPE, 2-500ml Amber |
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|-----------|--|------------------|-------------|
| Cooler#: | | Temperature(°C): | |
| Sample ID | | Bottle Count | Bottle Type |
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|-----------|--|------------------|-------------|
| Cooler#: | | Temperature(°C): | |
| Sample ID | | Bottle Count | Bottle Type |
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|-----------|--|------------------|-------------|
| Cooler#: | | Temperature(°C): | |
| Sample ID | | Bottle Count | Bottle Type |
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Completed by: JP Date: 3/26/10 Time: 1540



ARI Job No: Q003

PC: Kelly
VTSR: 03/26/10

Inquiry Number:
Analysis Requested: 03/27/10
Contact: Ernst, Will
Client: The Boeing Company
Logged by: JP
Sample Set Used: Yes-376
Validatable Package: Yes
Deliverables:

Project #:
Project: Boeing Plant 2 Source Control
Sample Site:
SDG No:
Analytical Protocol: In-house

| LOGNUM | ARI ID | CLIENT ID | CN | WAD | NH3 | COD | FOG | MET | PHEN | PHOS | TKN | NO23 | TOC | S2 | AK102 | Fe2+ | DMET | DOC | FLT | FLT | PARAMETER | ADJUSTED | LOT | AMOUNT | DATE/BY |
|---------|--------|------------------|-----|-----|-----|-----|-----|-----|------|------|-----|------|-----|----|-------|------|------|-----|-----|-----|-----------|----------|-----|--------|---------|
| 10-7889 | | | >12 | >12 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | >9 | <2 | <2 | | | | | | | | | |
| Q003A | | PL2SC-EB1-032610 | | | | | | DIS | | | | | | | | | | | | | | | | | |

0002:00010

Checked By JP Date 3/26/10

Analytical Resources, Incorporated
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)

| | |
|-------------------|-------------------|
| Page: 1 | of 1 |
| Date: 3/29/2010 | Ice Present? Y |
| No. of Coolers: 1 | Cooler Temps: 4.7 |

| | |
|---|-------------------------------|
| ARI Assigned Number: | Turn-around Requested: |
| ARI Client Company: <i>Boeing</i> | Phone: |
| Client Contact: <i>Will Ernst</i> | |
| Client Project Name: <i>BPR Source Control</i> | |
| Client Project #: | Samplers: <i>Liz Shear</i> |

[illegible]

| Analysis Requested | | | | | | Notes/Comments |
|---------------------------------|----------------|----|-----------------------------|--|--|------------------|
| Dissolved SMS Metals* | LL Hg DSS * | Pt | | | | * field filtered |
| X | X | X | | | | |
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| Relinquished by: (Signature) | | | Received by: (Signature) | | | |
| Printed Name: | | | Printed Name: | | | |
| Company: | | | Company: | | | |
| Date & Time: | | | Date & Time: | | | |

Limits of Liability: ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.

002:0001



Cooler Receipt Form

ARI Client: Breing

COC No(s): _____ (NA)

Assigned ARI Job No: Q028

Project Name: BP 2 Source Control

Delivered by: Fed-Ex UPS Courier (Hand Delivered Other: _____)

Tracking No: _____ (NA)

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to cooler? YES (NO)

Were custody papers included with the cooler? YES NO

Were custody papers properly filled out (ink, signed, etc.) YES NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry) 4.7

If cooler temperature is out of compliance fill out form 00070F Temp Gun ID#: 909411019

Cooler Accepted by: AV Date: 3/29/10 Time: 1330

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler? YES (NO)

What kind of packing material was used? ... Bubble Wrap Wet Ice Gel Packs Baggies Foam Block Paper Other: _____

Was sufficient ice used (if appropriate)? NA YES NO

Were all bottles sealed in individual plastic bags? YES (NO)

Did all bottles arrive in good condition (unbroken)? YES NO

Were all bottle labels complete and legible? YES NO

Did the number of containers listed on COC match with the number of containers received? YES NO

Did all bottle labels and tags agree with custody papers? YES NO

Were all bottles used correct for the requested analyses? YES NO

Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)... NA YES NO

Were all VOC vials free of air bubbles? (NA) YES NO

Was sufficient amount of sample sent in each bottle? YES NO

Date VOC Trip Blank was made at ARI: (NA)

Was Sample Split by ARI: (NA) YES Date/Time: _____ Equipment: _____ Split by: _____

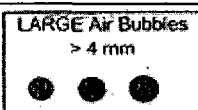
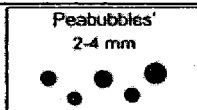
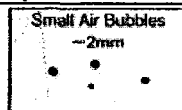
Samples Logged by: JW Date: 3/29/10 Time: 1435

**** Notify Project Manager of discrepancies or concerns ****

| Sample ID on Bottle | Sample ID on COC | Sample ID on Bottle | Sample ID on COC |
|---------------------|------------------|---------------------|------------------|
| | | | |
| | | | |
| | | | |
| | | | |

Additional Notes, Discrepancies, & Resolutions:

By: _____ Date: _____



Small → "sm"

Peabubbles → "pb"

Large → "lg"

Headspace → "hs"

PRESERVATION VERIFICATION 03/29/10

Page 1 of 1



ARI Job No: QQ28

PC: Kelly

VTSR: 03/29/10

Inquiry Number:

Analysis Requested: 03/29/10

Contact: Ernst, Will

Client: The Boeing Company

Logged by: JW

Sample Set Used: Yes-376

Validatable Package: Yes

Deliverables:

Project #:

Project: Boeing Plant 2 Source Control

Sample Site:

SDG No:

Analytical Protocol: In-house

| LOGNUM | ARI ID | CLIENT ID | CN | WAD | NH3 | COD | FOG | MET | PHEN | PHOS | TKN | NO23 | TOC | S2 | AK102 | Fe2+ | DMET | DOC | FLT | FLT | PARAMETER | ADJUSTED | LOT | NUMBER | AMOUNT | DATE/BY |
|---------|--------|------------------|----|-----|-----|-----|-----|-----|------|------|-----|------|-----|----|-------|------|------|-----|-----|-----|-----------|----------|-----|--------|--------|---------|
| 10-8066 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| QQ28A | | PL2SC-W-A-032910 | | | | | | | | | | | | | | | | | | | | | | | | |

0002:00013

Checked By JW Date 3/29/10

Analytical Resources, Incorporated
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)

[illegible]

Limits of Liability: ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, notwithstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.





Cooler Receipt Form

ARI Client: Boeing

COC No(s): _____ (NA)

Assigned ARI Job No: QQ32

Project Name: BP2 Source Control

Delivered by: Fed-Ex UPS Courier (Hand Delivered Other: _____)

Tracking No: _____ (NA)

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to cooler? YES (NO)
Were custody papers included with the cooler? (YES) NO
Were custody papers properly filled out (ink, signed, etc.) (YES) NO
Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry) 4.7
If cooler temperature is out of compliance fill out form 00070F Temp Gun ID#: 909411019

Cooler Accepted by: AV Date: 3/29/10 Time: 1330

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler? YES (NO)
What kind of packing material was used? ... Bubble Wrap (Wet Ice) Gel Packs Baggies Foam Block Paper Other: _____
Was sufficient ice used (if appropriate)? NA (YES) NO
Were all bottles sealed in individual plastic bags? YES (NO)
Did all bottles arrive in good condition (unbroken)? (YES) NO
Were all bottle labels complete and legible? (YES) NO
Did the number of containers listed on COC match with the number of containers received? (YES) NO
Did all bottle labels and tags agree with custody papers? (YES) NO
Were all bottles used correct for the requested analyses? (YES) NO
Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)... NA (YES) NO
Were all VOC vials free of air bubbles? (NA) YES NO
Was sufficient amount of sample sent in each bottle? (YES) NO
Date VOC Trip Blank was made at ARI: (NA)
Was Sample Split by ARI: (NA) YES Date/Time: _____ Equipment: _____ Split by: _____

Samples Logged by: SW Date: 3/29/10 Time: 1436

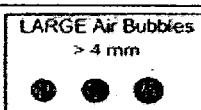
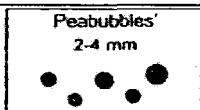
**** Notify Project Manager of discrepancies or concerns ****

| Sample ID on Bottle | Sample ID on COC | Sample ID on Bottle | Sample ID on COC |
|---------------------|------------------|---------------------|------------------|
| | | | |
| | | | |
| | | | |
| | | | |

Additional Notes, Discrepancies, & Resolutions:

By: _____

Date: _____



Small → "sm"

Peabubbles → "pb"

Large → "lg"

Headspace → "hs"



ARI Job No: Q032

PC: Kelly

VTSR: 03/29/10

Inquiry Number:

Analysis Requested: 03/29/10

Contact: Ernst, Will

Client: The Boeing Company

Logged by: JW

Sample Set Used: Yes-376

Validatable Package: Yes

Deliverables:

Project #:

Project: Boeing Plant 2 Source Control

Sample Site:

SDG No:

Analytical Protocol: In-house

| LOGNUM ARI ID | CLIENT ID | CN >12 | WAD >12 | NH3 <2 | COD <2 | FOG <2 | MET <2 | PHEN <2 | PHOS <2 | TKN <2 | NO23 <2 | TOC <2 | S2 >9 | AK102Fe2+ <2 | DMET DOC FLT FLT | ADJUSTED TO | LOT NUMBER | AMOUNT ADDED | DATE/BY |
|------------------|------------------|-----------|------------|-----------|-----------|-----------|-------------|------------|------------|-----------|------------|-----------|----------|-----------------|---------------------|----------------|---------------|-----------------|---------|
| 10-8068 Q032A | PL2SC-W-A-032910 | | | | | | DIS p455 | | | | | | | | Y | | | | |

Q002:00016

Checked By JW Date 3/29/10

Case Narrative

prepared
for

The Boeing Company

Project: Boeing Plant 2 Source Control,

ARI JOB NO: QQ02, QQ03, QQ28, QQ32

prepared
by

Analytical Resources, Inc.

**Case Narrative****Project: Boeing Plant 2 Source Control****ARI IDs: QQ02 / QQ03 / QQ28 / QQ32****Matrix: Water****Date: April 27, 2010****Sample Receipt Information**

One water sample was received in good condition at Analytical Resources, Inc. (ARI) on March 26, 2010 under ARI Sample Delivery Groups (SDGs) QQ02 and QQ03. The cooler temperature, as measured by IR thermometer, was 13.0°C. For further details regarding sample receipt, please refer to the enclosed Cooler Receipt Form and Preservation Verification sheet.

One water sample was received in good condition at Analytical Resources, Inc. (ARI) on March 29, 2010 under ARI Sample Delivery Groups (SDGs) QQ28 and QQ32. The cooler temperature, as measured by IR thermometer, was 4.7°C. For further details regarding sample receipt, please refer to the enclosed Cooler Receipt Form and Preservation Verification sheet.

The samples were analyzed for the parameters listed below, as requested on the Chain of Custodies.

PCBs by Method 8082

The sample was extracted on 3/30/10 and analyzed on 4/7/10 - within the method recommended holding time.

Initial calibration(s): All analytes of interest were within method acceptance criteria.

Continuing calibration(s): All analytes of interest were within method acceptance criteria.

Internal Standards: The internal standards were in control.

Surrogates: All surrogate recoveries were within control limits.

Method Blank(s): The method blanks were free of contamination.

Samples: There were no anomalies associated with these samples.

LCS/LCSD(s): The LCS and LCSD were in control.

Dissolved Metals by Methods 6010B and 200.8

The samples were digested on 3/29/10 and 4/1/10. The digests were analyzed between 4/8/10 – and 4/21/10 within the method recommended holding time.

Samples: No anomalies were encountered for these samples.

Lab Control(s): All percent recoveries were within control.



Case Narrative

Project: Boeing Plant 2 Source Control

ARI IDs: QQ02 / QQ03 / QQ28 / QQ32

Matrix: Water

Date: April 27, 2010

Method Blank(s): The method blank was free of contamination.

Dissolved Low-Level Mercury by Method 7470A

The samples were digested on 3/30 and 3/31/10. The digests were analyzed on 4/5/10 - within the method recommended holding time.

Samples: No anomalies were encountered for these samples.

Lab Control(s): All percent recoveries were within control.

Method Blank(s): The method blank was free of contamination.

Matrix spikes and sample duplicates: Are in control.

pH by Method 150.1

The sample was analyzed on 3/29/10 – outside of the method recommended holding time of fifteen minutes.

Samples: No anomalies were encountered for the sample.

Replicate(s): RPDs/RSDs were in control.

Lab Control(s): All percent recoveries were within compliance.



Data Reporting Qualifiers

Effective 7/10/2009

Inorganic Data

- U Indicates that the target analyte was not detected at the reported concentration
- * Duplicate RPD is not within established control limits
- B Reported value is less than the CRDL but \geq the Reporting Limit
- N Matrix Spike recovery not within established control limits
- NA Not Applicable, analyte not spiked
- H The natural concentration of the spiked element is so much greater than the concentration spiked that an accurate determination of spike recovery is not possible
- L Analyte concentration is ≤ 5 times the Reporting Limit and the replicate control limit defaults to ± 1 RL instead of the normal 20% RPD

Organic Data

- U Indicates that the target analyte was not detected at the reported concentration
- * Flagged value is not within established control limits
- B Analyte detected in an associated Method Blank at a concentration greater than one-half of ARI's Reporting Limit or 5% of the regulatory limit or 5% of the analyte concentration in the sample.
- J Estimated concentration when the value is less than ARI's established reporting limits
- D The spiked compound was not detected due to sample extract dilution
- E Estimated concentration calculated for an analyte response above the valid instrument calibration range. A dilution is required to obtain an accurate quantification of the analyte.
- Q Indicates a detected analyte with an initial or continuing calibration that does not meet established acceptance criteria ($<20\%$ RSD, $<20\%$ Drift or minimum RRF).
- S Indicates an analyte response that has saturated the detector. The calculated concentration is not valid; a dilution is required to obtain valid quantification of the analyte



- NA The flagged analyte was not analyzed for
- NR Spiked compound recovery is not reported due to chromatographic interference
- NS The flagged analyte was not spiked into the sample
- M Estimated value for an analyte detected and confirmed by an analyst but with low spectral match parameters. This flag is used only for GC-MS analyses
- M2 The sample contains PCB congeners that do not match any standard Aroclor pattern. The PCBs are identified and quantified as the Aroclor whose pattern most closely matches that of the sample. The reported value is an estimate.
- N The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification"
- Y The analyte is not detected at or above the reported concentration. The reporting limit is raised due to chromatographic interference. The Y flag is equivalent to the U flag with a raised reporting limit.
- C The analyte was positively identified on only one of two chromatographic columns. Chromatographic interference prevented a positive identification on the second column
- P The analyte was detected on both chromatographic columns but the quantified values differ by $\geq 40\%$ RPD with no obvious chromatographic interference

Geotechnical Data

- A The total of all fines fractions. This flag is used to report total fines when only sieve analysis is requested and balances total grain size with sample weight.
- F Samples were frozen prior to particle size determination
- SM Sample matrix was not appropriate for the requested analysis. This normally refers to samples contaminated with an organic product that interferes with the sieving process and/or moisture content, porosity and saturation calculations
- SS Sample did not contain the proportion of "fines" required to perform the pipette portion of the grain size analysis
- W Weight of sample in some pipette aliquots was below the level required for accurate weighting

SURR SOLUTIONS

4/3/2010

| LABEL | SOLN ID | TEST | CONC. UG/ML | SOLVENT | EXP. |
|----------------------|---------|------------|-------------|---------|----------|
| A | 1706-2 | ABN | 100/150 | MEOH | 07/30/10 |
| B | 1633-3 | SIM PNA | 15/75 | MEOH | 08/12/10 |
| C | 1705-4 | SIM ABN | 25/37.5 | MEOH | 03/08/11 |
| D | 1689-2 | LOW PCB | 0.2 | ACETONE | 12/29/10 |
| E | 1661-2 | HERB | 62.5 | MEOH | 10/02/10 |
| F | 1683-3 | PCP | 12.5 | ACETONE | 12/09/10 |
| G | 1707-2 | 1,4DIOXANE | 100 | MEOH | 03/19/11 |
| H | 1723-2 | OP-PEST | 25 | MEOH | 04/02/11 |
| I | 1634-1 | LOW S. PNA | 1.5 | MEOH | 08/12/10 |
| J | 1681-2 | TBT-PORE | 0.125 | MECL2 | 12/01/10 |
| K | 1689-1 | MED PCB | 20 | ACETONE | 12/29/10 |
| L | 1681-1 | TBT | 2.5 | MECL2 | 12/01/10 |
| M | 1682-1 | EPH | 1500 | MECL2 | 09/17/10 |
| N | 1689-3 | PCB | 2 | ACETONE | 12/29/10 |
| O | 1699-1 | TPH | 450 | MECL2 | 07/02/10 |
| P | 1707-4 | HCID | 2250 | MECL2 | 07/02/10 |
| Q | 1620-2 | EDB | 1 | MEOH | 06/22/10 |
| R | 1615-1 | RESIN ACID | 250 | ACETONE | 06/17/10 |
| S* | 1568-5 | PBDE | .25 | MEOH | 01/13/11 |
| T | 1674-2 | ALKYL PNA | 10 | MEOH | 07/30/10 |
| U | 1633-1 | CONGENER | 2.5 | ACETONE | 08/11/10 |
| V | | | | | |
| *reverified solution | | | | | |
| #project specific | | | | | |
| Y | | | | | |
| Z | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

LCS SOLUTIONS

4/3/2010

| LABL | SOLN ID | TEST | CONC. UG/ML | SOLVENT | EXP. |
|------|---------|--------------|-------------|---------|----------|
| 1 | 1716-1 | PCB 1660 | 20 | ACETONE | 03/30/11 |
| 2# | 1472-3 | BCOC PEST | 10 | ACETONE | NA |
| 3 | 1705-3 | PEST | 02/04/20 | ACETONE | 03/08/11 |
| 4 | 1667-1 | LOW PEST | 0.2/0.4/2 | ACETONE | 06/26/10 |
| 5 | 1677-1 | EPH | 1500 | MECL2 | 11/12/10 |
| 6 | 1702-2 | PCP | 12.5/125 | ACETONE | 02/18/11 |
| 7 | 1705-1 | ABN | 100 | ACETONE | 07/01/10 |
| 8 | 1681-4 | TBT | 2.5 | MECL2 | 12/01/10 |
| 9 | 1682-2 | PORE TBT | .125/.25 | MECL2 | 12/01/10 |
| 10 | 1698-2 | ABN ACID | 100/200 | MECL2 | 07/14/10 |
| 11 | 1642-2 | TPHD | 15000 | ACETONE | 09/07/10 |
| 12 | 1698-1 | ABN BASE | 200 | MEOH | 07/24/10 |
| 13 | 1613-1 | LOW PCB | 2 | ACETONE | 06/08/10 |
| 14* | 1547-1 | LOW ABN ACID | 10/20 | MEOH | 04/10/10 |
| 15 | 1716-2 | SIM PNA | 15/75 | MEOH | 03/30/11 |
| 16 | 1707-1 | DIOXANE | 100 | MEOH | 11/05/10 |
| 17 | 1644-1 | 1248 PCB | 10 | ACETONE | 09/10/10 |
| 18* | 1591-4 | LOW SIM PNA | 1.5 | ACETONE | 08/28/10 |
| 19 | 1685-3 | AK103 | 7500 | ACETONE | 09/03/10 |
| 20 | 1682-4 | PNA | 100 | ACETONE | 12/04/10 |
| 21 | 1593-3 | SKY/BHT | 100 | MEOH | 03/31/10 |
| 22 | 1702-4 | HERB | 12.5/12500 | MEOH | 04/17/10 |
| 23 | 1706-1 | LW ABN BASE | 20 | MEOH | 03/08/11 |
| 24 | 1696-1 | LOW ABN | 10 | ACETONE | 01/13/11 |
| 25# | 1481-1 | DIPHENYL | 100 | MEOH | NA |
| 26 | 1723-3 | OP-PEST | 25 | MEOH | 11/20/10 |
| 27 | 1668-3 | STEROLS | 200 | MEOH | 10/30/10 |
| 28# | 1684-1 | ADD. PEST | 4 | ACETONE | 03/25/10 |
| 29# | 1496-3 | DECANES | 100 | MEOH | NA |
| 30 | 1620-1 | EDB/DBCP | 0.2 | MEOH | 06/22/10 |

LCS SOLUTIONS

4/3/2010

| | | | | | |
|-----------------------------|--------|-------------|--------|---------|----------|
| 31 | 1707-3 | TERPINEOL | 100 | MEOH | 03/19/11 |
| 32 | 1619-3 | GUAIACOL | 50-200 | ACETONE | 04/30/10 |
| 33 | 1639-3 | RETENE | 100 | MEOH | 09/03/10 |
| 34 | 1633-1 | CONGENERS | 2.5 | ACETONE | 08/11/10 |
| 35 | 1674-3 | ALKYL PNA A | 10 | MEOH | 10/28/10 |
| 36 | 1601-3 | ALKYL PNA B | 10 | MEOH | 05/13/10 |
| 50 | 1617-1 | FULL RESIN | 250 | ACETONE | 06/17/10 |
| 51 | 1696-3 | DDTS | 2.5 | ACETONE | 06/03/10 |
| 52 | 1613-5 | 1232 PCB | 20 | ACETONE | 06/16/10 |
| 53 | 1703-3 | DALAPON | 50 | MEOH | 09/11/10 |
| 54 | 1701-2 | PBDE | 0.5 | ACETONE | 02/10/11 |
| #=PROJECT SPECIFIC SOLUTION | | | | | |
| *=REVERIFIED SOLUTION | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |



Spike Recovery Control Limits Analysis of PCB / Aroclors in Aqueous Samples - EPA SW-846 Methods 8081 & 8082 ^(1,2)

Effective 5/1/09

Control limits are updated periodically. Assure that you have ARI's current control limits by downloading the files at the time of use. <http://www.arilabs.com/portal/downloads/ARI-CLS.zip>

| Analytical Method: | Standard Analysis | MTCA Analysis | Low Level Analysis | Manchester Extraction |
|---|-------------------|-----------------|--------------------|-------------------------|
| Sample Weight / Final Volume: | 500 / 5 mL | 500 / 1 mL | 1000 / 0.5 mL | 3000 / 1 mL |
| LCS Spike Recovery ⁽⁴⁾ | | | | |
| Aroclor 1016 | 45 - 121 | 36 - 100 | 44 - 117 | 30 - 160 ⁽³⁾ |
| Aroclor 1260 | 54 - 129 | 41 - 113 | 46 - 131 | 30 - 160 ⁽³⁾ |
| | | | | |
| Method Blank/LCS Surrogate Recovery | | | | |
| Tetrachloro- <i>meta</i> -xylene (TCMX) | 40 - 118 | 29 - 100 | 31 - 100 | 30 - 160 ⁽³⁾ |
| Decachlorobiphenyl | 41 - 111 | 35 - 116 | 32 - 108 | 30 - 160 ⁽³⁾ |
| | | | | |
| Sample Surrogate Recovery | | | | |
| Tetrachloro- <i>meta</i> -xylene (TCMX) | 38 - 118 | 25 - 100 | 21 - 100 | 30 - 160 ⁽³⁾ |
| Decachlorobiphenyl | 29 - 118 | 10 - 128 | 19 - 111 | 30 - 160 ⁽³⁾ |

(1) Control Limits calculated using all data generated 1/1/08 through 12/1/08.

(2) Highlighted control limits (**bold font**) adjusted to demonstrate that ARI does not use control limits < 10 for the lower limit or < 100 for the upper limit.

(3) 30 – 160 are default, advisory control limits used when there is insufficient data to calculate historic control limits. **DO NOT** use these limits as the sole reason to reject the data from a batch of analyses.

(4) Laboratory Control Sample (LCS) spike recovery control limits also used as advisory control limits for sample matrix spike (MS) analyzes. MS recovery values are advisory and not used to assess the acceptability of an analytical batch.



Summary of Laboratory Control Limits Metals Analyses (All Methods & Sample Matrices)

Effective 5/1/09

Control limits are updated periodically. Assure that you have ARI's current control limits by downloading the files at the time of use. <http://www.arilabs.com/portal/downloads/ARI-CLs.zip>

| Element | Matrix Spike Recovery | LCS Recovery | Replicate RPD |
|-----------|-----------------------|--------------|---------------|
| Aluminum | 75 - 125 | 80 - 120 | ≤ 20% |
| Antimony | 75 - 125 | 80 - 120 | ≤ 20% |
| Arsenic | 75 - 125 | 80 - 120 | ≤ 20% |
| Barium | 75 - 125 | 80 - 120 | ≤ 20% |
| Beryllium | 75 - 125 | 80 - 120 | ≤ 20% |
| Boron | 75 - 125 | 80 - 120 | ≤ 20% |
| Cadmium | 75 - 125 | 80 - 120 | ≤ 20% |
| Calcium | 75 - 125 | 80 - 120 | ≤ 20% |
| Chromium | 75 - 125 | 80 - 120 | ≤ 20% |
| Cobalt | 75 - 125 | 80 - 120 | ≤ 20% |
| Copper | 75 - 125 | 80 - 120 | ≤ 20% |
| Iron | 75 - 125 | 80 - 120 | ≤ 20% |
| Lead | 75 - 125 | 80 - 120 | ≤ 20% |
| Magnesium | 75 - 125 | 80 - 120 | ≤ 20% |
| Manganese | 75 - 125 | 80 - 120 | ≤ 20% |
| Mercury | 75 - 125 | 80 - 120 | ≤ 20% |
| Nickel | 75 - 125 | 80 - 120 | ≤ 20% |
| Potassium | 75 - 125 | 80 - 120 | ≤ 20% |
| Selenium | 75 - 125 | 80 - 120 | ≤ 20% |
| Silica | 75 - 125 | 80 - 120 | ≤ 20% |
| Silver | 75 - 125 | 80 - 120 | ≤ 20% |
| Sodium | 75 - 125 | 80 - 120 | ≤ 20% |
| Strontium | 75 - 125 | 80 - 120 | ≤ 20% |
| Thallium | 75 - 125 | 80 - 120 | ≤ 20% |
| Vanadium | 75 - 125 | 80 - 120 | ≤ 20% |
| Zinc | 75 - 125 | 80 - 120 | ≤ 20% |



| Spike Recovery Control Limits for Conventional Wet Chemistry | | |
|---|----------------------|-----------------|
| Effective 5/1/09 | | |
| Control limits are updated periodically. Assure that you have ARI's current control limits by downloading the files at the time of use. http://www.arilabs.com/portal/downloads/ARI-CLs.zip | | |
| | ARI's Control Limits | |
| Sample Matrix: | Water | Soil / Sediment |
| Matrix Spike Recoveries | % Recovery | % Recovery |
| Ammonia | 75 - 125 | 75 - 125 |
| Bromide | 75 - 125 | 75 - 125 |
| Chloride | 75 - 125 | 75 - 125 |
| Cyanide | 75 - 125 | 75 - 125 |
| Ferrous Iron | 75 - 125 | 75 - 125 |
| Fluoride | 75 - 125 | 75 - 125 |
| Formaldehyde | 75 - 125 | 75 - 125 |
| Hexane Extractable Material | -- - -- | 78 - 114 |
| Hexavalent Chromium | 75 - 125 | 75 - 125 |
| Nitrate/Nitrite | 75 - 125 | 75 - 125 |
| Oil and Grease | 75 - 125 | 75 - 125 |
| Phenol | 75 - 125 | 75 - 125 |
| Phosphorous | 75 - 125 | 75 - 125 |
| Sulfate | 75 - 125 | 75 - 125 |
| Sulfide | 75 - 125 | 75 - 125 |
| Total Kjeldahl Nitrogen | 75 - 125 | 75 - 125 |
| Total Organic Carbon | 75 - 125 | 75 - 125 |
| Duplicate RPDs | | |
| Acidity | ±20% | ±20% |
| Alkalinity | ±20% | ±20% |
| BOD | ±20% | ±20% |
| Cation Exchange | ±20% | ±20% |
| COD | ±20% | ±20% |
| Conductivity | ±20% | ±20% |
| Salinity | ±20% | ±20% |
| Solids | ±20% | ±20% |
| Turbidity | ±20% | ±20% |

Data Summary Package

prepared
for

The Boeing Company

Project: Boeing Plant 2 Source Control,

ARI JOB NO: QQ02, QQ03, QQ28, QQ32

prepared
by

Analytical Resources, Inc.

PCB ANALYSIS

ORGANICS ANALYSIS DATA SHEET

PCB by GC/ECD Method SW8082

Page 1 of 1


Sample ID: PL2SC-EB1-032610

SAMPLE

Lab Sample ID: QQ03A

LIMS ID: 10-7889

Matrix: Water

Data Release Authorized: 

Reported: 04/08/10

QC Report No: QQ03-The Boeing Company

Project: Boeing Plant 2 Source Control

Date Sampled: 03/26/10

Date Received: 03/26/10

Date Extracted: 03/30/10

Date Analyzed: 04/07/10 00:23

Instrument/Analyst: ECD7/JGR

GPC Cleanup: No

Sulfur Cleanup: Yes

Sample Amount: 1000 mL

Final Extract Volume: 0.50 mL

Dilution Factor: 1.00

Silica Gel: No

Acid Cleanup: Yes

| CAS Number | Analyte | RL | Result |
|------------|--------------|-------|-----------|
| 12674-11-2 | Aroclor 1016 | 0.010 | < 0.010 U |
| 53469-21-9 | Aroclor 1242 | 0.010 | < 0.010 U |
| 12672-29-6 | Aroclor 1248 | 0.010 | < 0.010 U |
| 11097-69-1 | Aroclor 1254 | 0.010 | < 0.010 U |
| 11096-82-5 | Aroclor 1260 | 0.010 | < 0.010 U |
| 11104-28-2 | Aroclor 1221 | 0.010 | < 0.010 U |
| 11141-16-5 | Aroclor 1232 | 0.010 | < 0.010 U |

Reported in $\mu\text{g/L}$ (ppb)

PCB Surrogate Recovery

| | |
|-----------------------|-------|
| Decachlorobiphenyl | 58.5% |
| Tetrachlorometaxylene | 68.0% |

SW8082/PCB WATER SURROGATE RECOVERY SUMMARY

Matrix: Water


QC Report No: QQ03-The Boeing Company
Project: Boeing Plant 2 Source Control

| Client ID | DCBP % REC | DCBP LCL-UCL | TCMX % REC | TCMX LCL-UCL | TOT OUT |
|------------------|---------------|-----------------|---------------|-----------------|---------|
| MB-033010 | 85.8% | 32-108 | 73.2% | 31-100 | 0 |
| LCS-033010 | 89.2% | 32-108 | 75.0% | 31-100 | 0 |
| LCSD-033010 | 86.8% | 32-108 | 70.8% | 31-100 | 0 |
| PL2SC-EB1-032610 | 58.5% | 19-111 | 68.0% | 21-100 | 0 |

Prep Method: SW3510C
Log Number Range: 10-7889 to 10-7889

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082
Page 1 of 1

Sample ID: LCS-033010
LCS/LCSD

Lab Sample ID: LCS-033010
LIMS ID: 10-7889
Matrix: Water
Data Release Authorized: 
Reported: 04/08/10

QC Report No: QQ03-The Boeing Company
Project: Boeing Plant 2 Source Control

Date Sampled: NA
Date Received: NA

Date Extracted LCS/LCSD: 03/30/10

Sample Amount LCS: 1000 mL
LCSD: 1000 mL

Date Analyzed LCS: 04/07/10 23:36
LCSD: 04/07/10 00:00

Final Extract Volume LCS: 0.50 mL
LCSD: 0.50 mL

Instrument/Analyst LCS: ECD7/JGR
LCSD: ECD7/JGR

Dilution Factor LCS: 1.00
LCSD: 1.00

GPC Cleanup: No
Sulfur Cleanup: Yes

Silica Gel: No
Acid Cleanup: Yes

| Analyte | LCS | Spike Added-LCS | LCS Recovery | LCSD | Spike Added-LCSD | LCSD Recovery | RPD |
|--------------|-------|--------------------|-----------------|-------|---------------------|------------------|------|
| Aroclor 1016 | 0.053 | 0.050 | 106% | 0.048 | 0.050 | 96.0% | 9.9% |
| Aroclor 1260 | 0.048 | 0.050 | 96.0% | 0.046 | 0.050 | 92.0% | 4.3% |

PCB Surrogate Recovery

| | LCS | LCSD |
|-----------------------|-------|-------|
| Decachlorobiphenyl | 89.2% | 86.8% |
| Tetrachlorometaxylene | 75.0% | 70.8% |

Results reported in $\mu\text{g/L}$
RPD calculated using sample concentrations per SW846.

4
PCB METHOD BLANK SUMMARY

BLANK NO.

QQ03MBW1

Lab Name: ANALYTICAL RESOURCES, INC

Client: THE BOEING COMPANY

ARI Job No.: QQ03

Project: BOEING PLANT 2 SOURC

Lab Sample ID: QQ03MBW1

Lab File ID: 0406A026

Date Extracted: 03/30/10

Matrix: LIQUID

Date Analyzed: 04/07/10

Instrument ID: ECD7

Time Analyzed: 2313

GC Columns: ZB5/ZB35

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

| | CLIENT SAMPLE NO. ===== | LAB SAMPLE ID ===== | DATE ANALYZED ===== |
|----|-------------------------------|---------------------------|---------------------------|
| 01 | QQ03LCSDW1 | QQ03LCSDW1 | 04/07/10 |
| 02 | PL2SC-EB1-032610 | QQ03A | 04/07/10 |
| 03 | QQ03LCSW1 | QQ03LCSW1 | 04/07/10 |

ALL RUNS ARE DUAL COLUMN

ORGANICS ANALYSIS DATA SHEET

PCB by GC/ECD Method SW8082

Page 1 of 1


Sample ID: MB-033010

METHOD BLANK

Lab Sample ID: MB-033010

LIMS ID: 10-7889

Matrix: Water

Data Release Authorized: 

Reported: 04/08/10

QC Report No: QQ03-The Boeing Company

Project: Boeing Plant 2 Source Control

Date Sampled: NA

Date Received: NA

Date Extracted: 03/30/10

Date Analyzed: 04/07/10 23:13

Instrument/Analyst: ECD7/JGR

GPC Cleanup: No

Sulfur Cleanup: Yes

Sample Amount: 1000 mL

Final Extract Volume: 0.50 mL

Dilution Factor: 1.00

Silica Gel: No

Acid Cleanup: Yes

| CAS Number | Analyte | RL | Result |
|------------|--------------|-------|-----------|
| 12674-11-2 | Aroclor 1016 | 0.010 | < 0.010 U |
| 53469-21-9 | Aroclor 1242 | 0.010 | < 0.010 U |
| 12672-29-6 | Aroclor 1248 | 0.010 | < 0.010 U |
| 11097-69-1 | Aroclor 1254 | 0.010 | < 0.010 U |
| 11096-82-5 | Aroclor 1260 | 0.010 | < 0.010 U |
| 11104-28-2 | Aroclor 1221 | 0.010 | < 0.010 U |
| 11141-16-5 | Aroclor 1232 | 0.010 | < 0.010 U |

Reported in $\mu\text{g/L}$ (ppb)

PCB Surrogate Recovery

| | |
|-----------------------|-------|
| Decachlorobiphenyl | 85.8% |
| Tetrachlorometaxylene | 73.2% |

METALS ANALYSIS

INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS
Page 1 of 1

Sample ID: PL2SC-EB1-032610
SAMPLE


Lab Sample ID: QQ03A

QC Report No: QQ03-The Boeing Company

LIMS ID: 10-7889

Project: Boeing Plant 2 Source Control

Matrix: Water

Data Release Authorized: 

Date Sampled: 03/26/10

Reported: 04/22/10

Date Received: 03/26/10

| Prep Meth | Prep Date | Analysis Method | Analysis Date | CAS Number | Analyte | RL | µg/L | Q |
|-----------|-----------|-----------------|---------------|------------|----------|-----|------|---|
| 200.8 | 03/29/10 | 200.8 | 04/21/10 | 7440-38-2 | Arsenic | 0.2 | 0.2 | U |
| 6010B | 03/29/10 | 6010B | 04/08/10 | 7440-43-9 | Cadmium | 2 | 2 | U |
| 6010B | 03/29/10 | 6010B | 04/08/10 | 7440-47-3 | Chromium | 5 | 5 | U |
| 6010B | 03/29/10 | 6010B | 04/08/10 | 7440-50-8 | Copper | 2 | 2 | U |
| 200.8 | 03/29/10 | 200.8 | 04/21/10 | 7439-92-1 | Lead | 1 | 1 | U |
| 6010B | 03/29/10 | 6010B | 04/08/10 | 7440-22-4 | Silver | 3 | 3 | U |
| 6010B | 03/29/10 | 6010B | 04/08/10 | 7440-66-6 | Zinc | 10 | 10 | U |

U-Analyte undetected at given RL

RL-Reporting Limit

INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS

Sample ID: METHOD BLANK

Page 1 of 1


Lab Sample ID: QQ03MB

QC Report No: QQ03-The Boeing Company

LIMS ID: 10-7889

Project: Boeing Plant 2 Source Control

Matrix: Water

Data Release Authorized: 

Date Sampled: NA

Reported: 04/22/10

Date Received: NA

| Prep Meth | Prep Date | Analysis Method | Analysis Date | CAS Number | Analyte | RL | µg/L | Q |
|--------------|--------------|--------------------|------------------|------------|----------|-----|------|---|
| 200.8 | 03/29/10 | 200.8 | 04/21/10 | 7440-38-2 | Arsenic | 0.2 | 0.2 | U |
| 6010B | 03/29/10 | 6010B | 04/08/10 | 7440-43-9 | Cadmium | 2 | 2 | U |
| 6010B | 03/29/10 | 6010B | 04/08/10 | 7440-47-3 | Chromium | 5 | 5 | U |
| 6010B | 03/29/10 | 6010B | 04/08/10 | 7440-50-8 | Copper | 2 | 2 | U |
| 200.8 | 03/29/10 | 200.8 | 04/21/10 | 7439-92-1 | Lead | 1 | 1 | U |
| 6010B | 03/29/10 | 6010B | 04/08/10 | 7440-22-4 | Silver | 3 | 3 | U |
| 6010B | 03/29/10 | 6010B | 04/08/10 | 7440-66-6 | Zinc | 10 | 10 | U |

U-Analyte undetected at given RL

RL-Reporting Limit

INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS
Page 1 of 1

Sample ID: LAB CONTROL


Lab Sample ID: QQ03LCS

QC Report No: QQ03-The Boeing Company

LIMS ID: 10-7889

Project: Boeing Plant 2 Source Control

Matrix: Water

Data Release Authorized: 

Date Sampled: NA

Reported: 04/22/10

Date Received: NA


BLANK SPIKE QUALITY CONTROL REPORT

| Analyte | Analysis Method | Spike Found | Spike Added | % Recovery | Q |
|----------|-----------------|-------------|-------------|------------|---|
| Arsenic | 200.8 | 26.0 | 25.0 | 104% | |
| Cadmium | 6010B | 541 | 500 | 108% | |
| Chromium | 6010B | 493 | 500 | 98.6% | |
| Copper | 6010B | 487 | 500 | 97.4% | |
| Lead | 200.8 | 26 | 25 | 104% | |
| Silver | 6010B | 518 | 500 | 104% | |
| Zinc | 6010B | 500 | 500 | 100% | |

Reported in µg/L

N-Control limit not met

Control Limits: 80-120%

INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS
Page 1 of 1Sample ID: PL2SC-W-A-032910
SAMPLELab Sample ID: QQ28A
LIMS ID: 10-8066
Matrix: Water
Data Release Authorized: 
Reported: 04/27/10QC Report No: QQ28-The Boeing Company
Project: Boeing Plant 2 Source ControlDate Sampled: 03/29/10
Date Received: 03/29/10

| Prep Meth | Prep Date | Analysis Method | Analysis Date | CAS Number | Analyte | RL | µg/L | Q |
|--------------|--------------|--------------------|------------------|------------|----------|-----|------|---|
| 200.8 | 04/01/10 | 200.8 | 04/21/10 | 7440-38-2 | Arsenic | 0.5 | 2.6 | |
| 6010B | 04/01/10 | 6010B | 04/08/10 | 7440-43-9 | Cadmium | 2 | 2 | U |
| 6010B | 04/01/10 | 6010B | 04/08/10 | 7440-47-3 | Chromium | 5 | 5 | U |
| 6010B | 04/01/10 | 6010B | 04/08/10 | 7440-50-8 | Copper | 2 | 2 | U |
| 200.8 | 04/01/10 | 200.8 | 04/21/10 | 7439-92-1 | Lead | 1 | 1 | U |
| 6010B | 04/01/10 | 6010B | 04/08/10 | 7440-22-4 | Silver | 3 | 3 | U |
| 6010B | 04/01/10 | 6010B | 04/08/10 | 7440-66-6 | Zinc | 10 | 10 | U |

U-Analyte undetected at given RL
RL-Reporting Limit

INORGANICS ANALYSIS DATA SHEET

DISSOLVED METALS

Page 1 of 1


Sample ID: PL2SC-W-A-032910

DUPLICATE

Lab Sample ID: QQ28A

LIMS ID: 10-8066

Matrix: Water

Data Release Authorized: 

Reported: 04/27/10

QC Report No: QQ28-The Boeing Company

Project: Boeing Plant 2 Source Control

Date Sampled: 03/29/10

Date Received: 03/29/10

MATRIX DUPLICATE QUALITY CONTROL REPORT

| Analyte | Analysis Method | Sample | Duplicate | RPD | Control Limit | Q |
|----------|-----------------|--------|-----------|------|---------------|---|
| Arsenic | 200.8 | 2.6 | 2.5 | 3.9% | +/- 20% | |
| Cadmium | 6010B | 2 U | 2 U | 0.0% | +/- 2 | L |
| Chromium | 6010B | 5 U | 5 U | 0.0% | +/- 5 | L |
| Copper | 6010B | 2 U | 2 U | 0.0% | +/- 2 | L |
| Lead | 200.8 | 1 U | 1 U | 0.0% | +/- 1 | L |
| Silver | 6010B | 3 U | 3 U | 0.0% | +/- 3 | L |
| Zinc | 6010B | 10 U | 10 U | 0.0% | +/- 10 | L |


Reported in µg/L

*-Control Limit Not Met

L-RPD Invalid, Limit = Detection Limit

INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS
Page 1 of 1

Sample ID: PL2SC-W-A-032910
MATRIX SPIKE

Lab Sample ID: QQ28A
LIMS ID: 10-8066
Matrix: Water
Data Release Authorized: 
Reported: 04/27/10

QC Report No: QQ28-The Boeing Company
Project: Boeing Plant 2 Source Control
Date Sampled: 03/29/10
Date Received: 03/29/10

MATRIX SPIKE QUALITY CONTROL REPORT

| Analyte | Analysis Method | Sample | Spike | Spike Added | % Recovery | Q |
|----------|-----------------|--------|-------|-------------|------------|---|
| Arsenic | 200.8 | 2.60 | 26.7 | 25.0 | 96.4% | |
| Cadmium | 6010B | 2.00 U | 542 | 500 | 108% | |
| Chromium | 6010B | 5.00 U | 512 | 500 | 102% | |
| Copper | 6010B | 2.00 U | 515 | 500 | 103% | |
| Lead | 200.8 | 1.00 U | 23.8 | 25.0 | 95.2% | |
| Silver | 6010B | 3.00 U | 424 | 500 | 84.8% | |
| Zinc | 6010B | 10.0 U | 506 | 500 | 101% | |

Reported in µg/L

N-Control Limit Not Met
H-% Recovery Not Applicable, Sample Concentration Too High
NA-Not Applicable, Analyte Not Spiked

Percent Recovery Limits: 75-125%

INORGANICS ANALYSIS DATA SHEET

DISSOLVED METALS

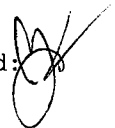
Page 1 of 1

Sample ID: METHOD BLANK

Lab Sample ID: QQ28MB

LIMS ID: 10-8066

Matrix: Water

Data Release Authorized: 

Reported: 04/27/10

QC Report No: QQ28-The Boeing Company

Project: Boeing Plant 2 Source Control

Date Sampled: NA

Date Received: NA

| Prep Meth | Prep Date | Analysis Method | Analysis Date | CAS Number | Analyte | RL | µg/L | Q |
|--------------|--------------|--------------------|------------------|------------|----------|-----|------|---|
| 200.8 | 04/01/10 | 200.8 | 04/21/10 | 7440-38-2 | Arsenic | 0.2 | 0.2 | U |
| 6010B | 04/01/10 | 6010B | 04/08/10 | 7440-43-9 | Cadmium | 2 | 2 | U |
| 6010B | 04/01/10 | 6010B | 04/08/10 | 7440-47-3 | Chromium | 5 | 5 | U |
| 6010B | 04/01/10 | 6010B | 04/08/10 | 7440-50-8 | Copper | 2 | 2 | U |
| 200.8 | 04/01/10 | 200.8 | 04/21/10 | 7439-92-1 | Lead | 1 | 1 | U |
| 6010B | 04/01/10 | 6010B | 04/08/10 | 7440-22-4 | Silver | 3 | 3 | U |
| 6010B | 04/01/10 | 6010B | 04/08/10 | 7440-66-6 | Zinc | 10 | 10 | U |

U-Analyte undetected at given RL

RL-Reporting Limit

INORGANICS ANALYSIS DATA SHEET

DISSOLVED METALS

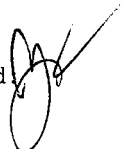
Page 1 of 1

Sample ID: LAB CONTROL

Lab Sample ID: QQ28LCS

LIMS ID: 10-8066

Matrix: Water

Data Release Authorized: 

Reported: 04/27/10

QC Report No: QQ28-The Boeing Company

Project: Boeing Plant 2 Source Control

Date Sampled: NA

Date Received: NA

BLANK SPIKE QUALITY CONTROL REPORT

| Analyte | Analysis Method | Spike Found | Spike Added | % Recovery | Q |
|----------|-----------------|-------------|-------------|------------|---|
| Arsenic | 200.8 | 25.3 | 25.0 | 101% | |
| Cadmium | 6010B | 540 | 500 | 108% | |
| Chromium | 6010B | 492 | 500 | 98.4% | |
| Copper | 6010B | 478 | 500 | 95.6% | |
| Lead | 200.8 | 26 | 25 | 104% | |
| Silver | 6010B | 512 | 500 | 102% | |
| Zinc | 6010B | 490 | 500 | 98.0% | |

Reported in µg/L

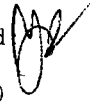
N-Control limit not met

Control Limits: 80-120%

MERCURY ANALYSIS

INORGANICS ANALYSIS DATA SHEET
Dissolved Mercury by Method SW7470A



Data Release Authorized 
Reported: 04/06/10
Date Received: 03/26/10
Page 1 of 1

QC Report No: QQ02-The Boeing Company
Project: Boeing Plant 2 Source Control


| Client/ ARI ID | Date Sampled | Matrix | Prep Date Anal Date | RL | Result |
|-----------------------------------|-----------------|--------|------------------------|------|--------|
| PL2SC-EB1-032610 QQ02A 10-7888 | 03/26/10 | Water | 03/30/10 04/05/10 | 20.0 | 20.0 U |
| MB-033010 Method Blank | NA | Water | 03/30/10 04/05/10 | 20.0 | 20.0 U |

Reported in ng/L

RL-Analytical reporting limit
U-Undetected at reported detection limit

INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS
Page 1 of 1

Sample ID: PL2SC-EB1-032610
DUPLICATE

Lab Sample ID: QQ02A
LIMS ID: 10-7888
Matrix: Water
Data Release Authorized: 
Reported: 04/06/10

QC Report No: QQ02-The Boeing Company
Project: Boeing Plant 2 Source Control
Date Sampled: 03/26/10
Date Received: 03/26/10

MATRIX DUPLICATE QUALITY CONTROL REPORT

| Analyte | Analysis Method | Sample | Duplicate | RPD | Control Limit | Q |
|---------|-----------------|--------|-----------|------|---------------|---|
| Mercury | 7470A | 20.0 U | 20.0 U | 0.0% | +/- 20.0 | L |

Reported in ng/L

*-Control Limit Not Met
L-RPD Invalid, Limit = Detection Limit

INORGANICS ANALYSIS DATA SHEET

DISSOLVED METALS

Page 1 of 1


Sample ID: PL2SC-EB1-032610

MATRIX SPIKE

Lab Sample ID: QQ02A

LIMS ID: 10-7888

Matrix: Water

Data Release Authorized 

Reported: 04/06/10

QC Report No: QQ02-The Boeing Company

Project: Boeing Plant 2 Source Control

Date Sampled: 03/26/10

Date Received: 03/26/10

MATRIX SPIKE QUALITY CONTROL REPORT

| Analyte | Analysis Method | Sample | Spike | Spike Added | % Recovery | Q |
|---------|-----------------|--------|-------|-------------|------------|---|
| Mercury | 7470A | 20.0 U | 91.6 | 100 | 91.6% | |

Reported in ng/L

N-Control Limit Not Met

H-% Recovery Not Applicable, Sample Concentration Too High

NA-Not Applicable, Analyte Not Spiked

Percent Recovery Limits: 75-125%


INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS
Page 1 of 1

Sample ID: LAB CONTROL

Lab Sample ID: QQ02LCS

LIMS ID: 10-7888

Matrix: Water

Data Release Authorized: 

Reported: 04/06/10

QC Report No: QQ02-The Boeing Company

Project: Boeing Plant 2 Source Control

Date Sampled: NA

Date Received: NA

BLANK SPIKE QUALITY CONTROL REPORT

| Analyte | Analysis Method | Spike Found | Spike Added | % Recovery | Q |
|---------|-----------------|-------------|-------------|------------|---|
| Mercury | 7470A | 183 | 200 | 91.5% | |


Reported in ng/L

N-Control limit not met

Control Limits: 80-120%

INORGANICS ANALYSIS DATA SHEET
Dissolved Mercury by Method SW7470A



Data Release Authorized: 
Reported: 04/06/10
Date Received: 03/29/10
Page 1 of 1

QC Report No: QQ32-The Boeing Company
Project: Boeing Plant 2 Source Control

| Client/ ARI ID | Date Sampled | Matrix | Prep Date Anal Date | RL | Result |
|-------------------|-----------------|--------|------------------------|------|--------|
| PL2SC-W-A-032910 | 03/29/10 | Water | 03/31/10 | 20.0 | 20.0 U |
| QQ32A 10-8068 | | | 04/05/10 | | |
| MB-033110 | NA | Water | 03/31/10 | 20.0 | 20.0 U |
| Method Blank | | | 04/05/10 | | |

Reported in ng/L

RL-Analytical reporting limit
U-Undetected at reported detection limit


INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS
Page 1 of 1

Sample ID: PL2SC-W-A-032910
DUPLICATE

Lab Sample ID: QQ32A

LIMS ID: 10-8068

Matrix: Water

Data Release Authorized: 

Reported: 04/06/10

QC Report No: QQ32-The Boeing Company

Project: Boeing Plant 2 Source Control

Date Sampled: 03/29/10

Date Received: 03/29/10

MATRIX DUPLICATE QUALITY CONTROL REPORT

| Analyte | Analysis Method | Sample | Duplicate | RPD | Control Limit | Q |
|---------|-----------------|--------|-----------|------|---------------|---|
| Mercury | 7470A | 20.0 U | 20.0 U | 0.0% | +/- 20.0 | L |

Reported in ng/L

*-Control Limit Not Met

L-RPD Invalid, Limit = Detection Limit

INORGANICS ANALYSIS DATA SHEET

DISSOLVED METALS

Page 1 of 1


Sample ID: PL2SC-W-A-032910

MATRIX SPIKE

Lab Sample ID: QQ32A

LIMS ID: 10-8068

Matrix: Water

Data Release Authorized: 

Reported: 04/06/10

QC Report No: QQ32-The Boeing Company

Project: Boeing Plant 2 Source Control

Date Sampled: 03/29/10

Date Received: 03/29/10

MATRIX SPIKE QUALITY CONTROL REPORT

| Analyte | Analysis Method | Sample | Spike | Spike Added | % Recovery | Q |
|---------|-----------------|--------|-------|-------------|------------|---|
| Mercury | 7470A | 20.0 U | 94.6 | 100 | 94.6% | |

Reported in ng/L

N-Control Limit Not Met


H-% Recovery Not Applicable, Sample Concentration Too High

NA-Not Applicable, Analyte Not Spiked

Percent Recovery Limits: 75-125%

INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS
Page 1 of 1

Sample ID: LAB CONTROL

Lab Sample ID: QQ32LCS
LIMS ID: 10-8068
Matrix: Water
Data Release Authorized: 
Reported: 04/06/10

QC Report No: QQ32-The Boeing Company
Project: Boeing Plant 2 Source Control
Date Sampled: NA
Date Received: NA

BLANK SPIKE QUALITY CONTROL REPORT

| Analyte | Analysis Method | Spike Found | Spike Added | % Recovery | Q |
|---------|-----------------|-------------|-------------|------------|---|
| Mercury | 7470A | 184 | 200 | 92.0% | |

Reported in ng/L

N-Control limit not met
Control Limits: 80-120%

GENERAL CHEMISTRY ANALYSIS

SAMPLE RESULTS-CONVENTIONALS
QQ28-The Boeing Company



Matrix: Water
Data Release Authorized:
Reported: 03/30/10

A handwritten signature, possibly 'M', is written over the 'Data Release Authorized:' line.

Project: Boeing Plant 2 Source Contro
Event: NA
Date Sampled: 03/29/10
Date Received: 03/29/10


Client ID: PL2SC-W-A-032910
ARI ID: 10-8066 QQ28A

| Analyte | Date Batch | Method | Units | RL | Sample |
|---------|----------------------|-----------|-----------|------|--------|
| pH | 03/29/10 032910#1 | EPA 150.1 | std units | 0.01 | 7.43 |

RL Analytical reporting limit
U Undetected at reported detection limit

LAB CONTROL RESULTS-CONVENTIONALS
QQ28-The Boeing Company



Matrix: Water
Data Release Authorized: 
Reported: 03/30/10


Project: Boeing Plant 2 Source Contro
Event: NA
Date Sampled: NA
Date Received: NA

| Analyte/Method | QC ID | Date | Units | LCS | Spike Added | Recovery |
|-----------------|-------|----------|-----------|------|-------------|----------|
| pH EPA 150.1 | ICVL | 03/29/10 | std units | 6.99 | 7.00 | 0.01 |

pH is evaluated as the Absolute Difference between the values rather than Percent Recovery.

REPLICATE RESULTS-CONVENTIONALS
QQ28-The Boeing Company



Matrix: Water
Data Release Authorized: 
Reported: 03/30/10

Project: Boeing Plant 2 Source Contro
Event: NA
Date Sampled: 03/29/10
Date Received: 03/29/10

| Analyte | Method | Date | Units | Sample | Replicate(s) | RPD/RSD |
|---------|--------|------|-------|--------|--------------|---------|
|---------|--------|------|-------|--------|--------------|---------|

ARI ID: QQ28A Client ID: PL2SC-W-A-032910

| | | | | | | |
|----|-----------|----------|-----------|------|------|------|
| pH | EPA 150.1 | 03/29/10 | std units | 7.43 | 7.43 | 0.00 |
|----|-----------|----------|-----------|------|------|------|

pH is evaluated as the Absolute Difference between the values rather than
Relative Percent Difference



Analytical Resources, Incorporated
Analytical Chemists and Consultants

May 7, 2010

Kent Angelos
Golder Associates, Inc.
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

RE: Boeing Plant 2 Source Control
ARI ID: QT80

Dear Kent:

Please find enclosed the original Chain-of-Custody (COC) records, sample receipt documentation, and the final data package for the project referenced above.

Sample receipt information and analytical details are addressed in the Case Narrative.

An electronic copy of this package will be kept on file at ARI. If you have any questions or require additional information, please contact me at your convenience.

Sincerely,
ANALYTICAL RESOURCES, INC.

Kelly Bottom
Client Services Manager
(206) 695-6211
kellyb@arilabs.com
www.arilabs.com

KB/eb

cc: Kent Angelos, Golder Associates Inc., 18300 NE Union Hill Road, Suite 200, Redmond, WA 98052-3333

**Chain of Custody
Documentation**

**prepared
for**

The Boeing Company

Project: BP2 Source Control,

ARI JOB NO: QT80

**prepared
by**

Analytical Resources, Inc.

Analytical Resources, Incorporated
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)

| | |
|-----------------|---------------|
| Page: 1 | of 1 |
| Date: 4/22/10 | Ice Present? |
| No. of Coolers: | Cooler Temps: |

| | |
|---|--------------------------------------|
| ARI Assigned Number: <i>QT 80</i> | Turn-around Requested: <i>5/d</i> |
| ARI Client Company: <i>Boeing</i> | Phone: |
| Client Contact: <i>Will Ewen</i> | |
| Client Project Name: <i>BL2 Source Control</i> | |
| Client Project #: | Samplers: <i>Liz Shea</i> |

[illegible]

Limits of Liability: ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.



Cooler Receipt Form

ARI Client: Boeing

COC No(s): _____ (NA)

Assigned ARI Job No: QT80

Project Name: BP2 Source Control

Delivered by: Fed-Ex UPS Courier Hand Delivered Other: _____

Tracking No: _____ (NA)

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to cooler? YES (NO)

Were custody papers included with the cooler? YES NO

Were custody papers properly filled out (ink, signed, etc.) YES NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry)..... ATB

If cooler temperature is out of compliance fill out form 00070F Temp Gun ID#: _____

Cooler Accepted by: MM Date: 4/22/10 Time: 050 750 mm

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler? YES (NO)

What kind of packing material was used? ... Bubble Wrap Wet Ice Gel Packs Baggies Foam Block Paper Other: _____

Was sufficient ice used (if appropriate)? (NA) YES NO

Were all bottles sealed in individual plastic bags? YES NO

Did all bottles arrive in good condition (unbroken)? YES NO

Were all bottle labels complete and legible? YES NO

Did the number of containers listed on COC match with the number of containers received? YES NO

Did all bottle labels and tags agree with custody papers? YES NO

Were all bottles used correct for the requested analyses? YES NO

Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)... (NA) YES NO

Were all VOC vials free of air bubbles? (NA) YES NO

Was sufficient amount of sample sent in each bottle? YES NO

Date VOC Trip Blank was made at ARI..... (NA)

Was Sample Split by ARI : (NA) YES Date/Time: _____ Equipment: _____ Split by: _____

Samples Logged by: MM Date: 4/22/10 Time: 051

**** Notify Project Manager of discrepancies or concerns ****

| Sample ID on Bottle | Sample ID on COC | Sample ID on Bottle | Sample ID on COC |
|---------------------|------------------|---------------------|------------------|
| | | | |
| | | | |
| | | | |
| | | | |

Additional Notes, Discrepancies, & Resolutions:

By: _____ Date: _____

| | | | |
|--------------------------------------|---------------------------------|--|-------------------|
| Small Air Bubbles ~2mm | Peabubbles 2-4 mm | LARGE Air Bubbles > 4 mm | Small → "sm" |
| | | | Peabubbles → "pb" |
| | | | Large → "lg" |
| | | | Headspace → "hs" |

Case Narrative

**prepared
for**

The Boeing Company

Project: BP2 Source Control,

ARI JOB NO: QT80

**prepared
by**

Analytical Resources, Inc.



Case Narrative

Project: Boeing Plant 2 Source Control

ARI ID: QT80

Matrix: Filter Bag

Date: May 7, 2010

Sample Receipt Information

One solid matrix sample was received in good condition at ARI on 04/22/10 under ARI sample delivery group QT80. One cooler arrived at an ambient temperature.

The sample was analyzed for the parameters listed below, as requested on the COC.

PCBs by Method 8082:

The sample was extracted on 4/26/10 and analyzed on 5/1/10 - within the method recommended holding times.

Initial calibration (s): All analytes of interest were within method acceptance criteria.

Continuing calibration (s): Are in control.

Internal Standard (s): Are in control.

Samples: There were no anomalies associated with these samples.

Surrogates: All surrogate recoveries were in control.

LCS(s): All percent recoveries for the analytes of interest were within compliance.

Method Blank: The method blank was free of contamination.

Total Metals by Methods 6010B, 200.8, and 7471A

The sample was digested on 4/22/10. The digests were analyzed between 4/23/10 and 5/5/10 - within the method recommended holding times.

Samples: No anomalies were encountered for these samples.

LCS/Blank Spike(s): All percent recoveries were within compliance.

Method Blank(s): Are in control.

Standard Reference: All percent recoveries were within compliance.



Data Reporting Qualifiers

Effective 7/10/2009

Inorganic Data

- U** Indicates that the target analyte was not detected at the reported concentration
- *** Duplicate RPD is not within established control limits
- B** Reported value is less than the CRDL but \geq the Reporting Limit
- N** Matrix Spike recovery not within established control limits
- NA** Not Applicable, analyte not spiked
- H** The natural concentration of the spiked element is so much greater than the concentration spiked that an accurate determination of spike recovery is not possible
- L** Analyte concentration is ≤ 5 times the Reporting Limit and the replicate control limit defaults to ± 1 RL instead of the normal 20% RPD

Organic Data

- U** Indicates that the target analyte was not detected at the reported concentration
- *** Flagged value is not within established control limits
- B** Analyte detected in an associated Method Blank at a concentration greater than one-half of ARI's Reporting Limit or 5% of the regulatory limit or 5% of the analyte concentration in the sample.
- J** Estimated concentration when the value is less than ARI's established reporting limits
- D** The spiked compound was not detected due to sample extract dilution
- E** Estimated concentration calculated for an analyte response above the valid instrument calibration range. A dilution is required to obtain an accurate quantification of the analyte.
- Q** Indicates a detected analyte with an initial or continuing calibration that does not meet established acceptance criteria ($<20\%$ RSD, $<20\%$ Drift or minimum RRF).
- S** Indicates an analyte response that has saturated the detector. The calculated concentration is not valid; a dilution is required to obtain valid quantification of the analyte



- NA The flagged analyte was not analyzed for
- NR Spiked compound recovery is not reported due to chromatographic interference
- NS The flagged analyte was not spiked into the sample
- M Estimated value for an analyte detected and confirmed by an analyst but with low spectral match parameters. This flag is used only for GC-MS analyses
- M2 The sample contains PCB congeners that do not match any standard Aroclor pattern. The PCBs are identified and quantified as the Aroclor whose pattern most closely matches that of the sample. The reported value is an estimate.
- N The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification"
- Y The analyte is not detected at or above the reported concentration. The reporting limit is raised due to chromatographic interference. The Y flag is equivalent to the U flag with a raised reporting limit.
- C The analyte was positively identified on only one of two chromatographic columns. Chromatographic interference prevented a positive identification on the second column
- P The analyte was detected on both chromatographic columns but the quantified values differ by $\geq 40\%$ RPD with no obvious chromatographic interference

Geotechnical Data

- A The total of all fines fractions. This flag is used to report total fines when only sieve analysis is requested and balances total grain size with sample weight.
- F Samples were frozen prior to particle size determination
- SM Sample matrix was not appropriate for the requested analysis. This normally refers to samples contaminated with an organic product that interferes with the sieving process and/or moisture content, porosity and saturation calculations
- SS Sample did not contain the proportion of "fines" required to perform the pipette portion of the grain size analysis
- W Weight of sample in some pipette aliquots was below the level required for accurate weighting

SURR SOLUTIONS

4/3/2010

| LABEL | SOLN ID | TEST | CONC. UG/ML | SOLVENT | EXP. |
|----------------------|---------|------------|-------------|---------|----------|
| A | 1706-2 | ABN | 100/150 | MEOH | 07/30/10 |
| B | 1633-3 | SIM PNA | 15/75 | MEOH | 08/12/10 |
| C | 1705-4 | SIM ABN | 25/37.5 | MEOH | 03/08/11 |
| D | 1689-2 | LOW PCB | 0.2 | ACETONE | 12/29/10 |
| E | 1661-2 | HERB | 62.5 | MEOH | 10/02/10 |
| F | 1683-3 | PCP | 12.5 | ACETONE | 12/09/10 |
| G | 1707-2 | 1,4DIOXANE | 100 | MEOH | 03/19/11 |
| H | 1723-2 | OP-PEST | 25 | MEOH | 04/02/11 |
| I | 1634-1 | LOW S. PNA | 1.5 | MEOH | 08/12/10 |
| J | 1681-2 | TBT-PORE | 0.125 | MECL2 | 12/01/10 |
| K | 1689-1 | MED PCB | 20 | ACETONE | 12/29/10 |
| L | 1681-1 | TBT | 2.5 | MECL2 | 12/01/10 |
| M | 1682-1 | EPH | 1500 | MECL2 | 09/17/10 |
| N | 1689-3 | PCB | 2 | ACETONE | 12/29/10 |
| O | 1699-1 | TPH | 450 | MECL2 | 07/02/10 |
| P | 1707-4 | HCID | 2250 | MECL2 | 07/02/10 |
| Q | 1620-2 | EDB | 1 | MEOH | 06/22/10 |
| R | 1615-1 | RESIN ACID | 250 | ACETONE | 06/17/10 |
| S* | 1568-5 | PBDE | .25 | MEOH | 01/13/11 |
| T | 1674-2 | ALKYL PNA | 10 | MEOH | 07/30/10 |
| U | 1633-1 | CONGENER | 2.5 | ACETONE | 08/11/10 |
| V | | | | | |
| *reverified solution | | | | | |
| #project specific | | | | | |
| Y | | | | | |
| Z | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

LCS SOLUTIONS

4/3/2010

| LABL | SOLN ID | TEST | CONC. UG/ML | SOLVENT | EXP. |
|------|---------|--------------|-------------|---------|----------|
| 1 | 1716-1 | PCB 1660 | 20 | ACETONE | 03/30/11 |
| 2# | 1472-3 | BCOC PEST | 10 | ACETONE | NA |
| 3 | 1705-3 | PEST | 02/04/20 | ACETONE | 03/08/11 |
| 4 | 1667-1 | LOW PEST | 0.2/0.4/2 | ACETONE | 06/26/10 |
| 5 | 1677-1 | EPH | 1500 | MECL2 | 11/12/10 |
| 6 | 1702-2 | PCP | 12.5/125 | ACETONE | 02/18/11 |
| 7 | 1705-1 | ABN | 100 | ACETONE | 07/01/10 |
| 8 | 1681-4 | TBT | 2.5 | MECL2 | 12/01/10 |
| 9 | 1682-2 | PORE TBT | .125/.25 | MECL2 | 12/01/10 |
| 10 | 1698-2 | ABN ACID | 100/200 | MECL2 | 07/14/10 |
| 11 | 1642-2 | TPHD | 15000 | ACETONE | 09/07/10 |
| 12 | 1698-1 | ABN BASE | 200 | MEOH | 07/24/10 |
| 13 | 1613-1 | LOW PCB | 2 | ACETONE | 06/08/10 |
| 14* | 1547-1 | LOW ABN ACID | 10/20 | MEOH | 04/10/10 |
| 15 | 1716-2 | SIM PNA | 15/75 | MEOH | 03/30/11 |
| 16 | 1707-1 | DIOXANE | 100 | MEOH | 11/05/10 |
| 17 | 1644-1 | 1248 PCB | 10 | ACETONE | 09/10/10 |
| 18* | 1591-4 | LOW SIM PNA | 1.5 | ACETONE | 08/28/10 |
| 19 | 1685-3 | AK103 | 7500 | ACETONE | 09/03/10 |
| 20 | 1682-4 | PNA | 100 | ACETONE | 12/04/10 |
| 21 | 1593-3 | SKY/BHT | 100 | MEOH | 03/31/10 |
| 22 | 1702-4 | HERB | 12.5/12500 | MEOH | 04/17/10 |
| 23 | 1706-1 | LW ABN BASE | 20 | MEOH | 03/08/11 |
| 24 | 1696-1 | LOW ABN | 10 | ACETONE | 01/13/11 |
| 25# | 1481-1 | DIPHENYL | 100 | MEOH | NA |
| 26 | 1723-3 | OP-PEST | 25 | MEOH | 11/20/10 |
| 27 | 1668-3 | STEROLS | 200 | MEOH | 10/30/10 |
| 28# | 1684-1 | ADD. PEST | 4 | ACETONE | 03/25/10 |
| 29# | 1496-3 | DECANES | 100 | MEOH | NA |
| 30 | 1620-1 | EDB/DBCP | 0.2 | MEOH | 06/22/10 |

LCS SOLUTIONS

4/3/2010

| | | | | | |
|-----------------------------|--------|-------------|--------|---------|----------|
| 31 | 1707-3 | TERPINEOL | 100 | MEOH | 03/19/11 |
| 32 | 1619-3 | GUAIACOL | 50-200 | ACETONE | 04/30/10 |
| 33 | 1639-3 | RETENE | 100 | MEOH | 09/03/10 |
| 34 | 1633-1 | CONGENERS | 2.5 | ACETONE | 08/11/10 |
| 35 | 1674-3 | ALKYL PNA A | 10 | MEOH | 10/28/10 |
| 36 | 1601-3 | ALKYL PNA B | 10 | MEOH | 05/13/10 |
| 50 | 1617-1 | FULL RESIN | 250 | ACETONE | 06/17/10 |
| 51 | 1696-3 | DDTS | 2.5 | ACETONE | 06/03/10 |
| 52 | 1613-5 | 1232 PCB | 20 | ACETONE | 06/16/10 |
| 53 | 1703-3 | DALAPON | 50 | MEOH | 09/11/10 |
| 54 | 1701-2 | PBDE | 0.5 | ACETONE | 02/10/11 |
| #=PROJECT SPECIFIC SOLUTION | | | | | |
| *=REVERIFIED SOLUTION | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |



Summary of Laboratory Control Limits Metals Analyses (All Methods & Sample Matrices)

Effective 5/1/09

Control limits are updated periodically. Assure that you have ARI's current control limits by downloading the files at the time of use. <http://www.arilabs.com/portal/downloads/ARI-CLs.zip>

| Element | Matrix Spike Recovery | LCS Recovery | Replicate RPD |
|-----------|-----------------------|--------------|---------------|
| Aluminum | 75 - 125 | 80 - 120 | ≤ 20% |
| Antimony | 75 - 125 | 80 - 120 | ≤ 20% |
| Arsenic | 75 - 125 | 80 - 120 | ≤ 20% |
| Barium | 75 - 125 | 80 - 120 | ≤ 20% |
| Beryllium | 75 - 125 | 80 - 120 | ≤ 20% |
| Boron | 75 - 125 | 80 - 120 | ≤ 20% |
| Cadmium | 75 - 125 | 80 - 120 | ≤ 20% |
| Calcium | 75 - 125 | 80 - 120 | ≤ 20% |
| Chromium | 75 - 125 | 80 - 120 | ≤ 20% |
| Cobalt | 75 - 125 | 80 - 120 | ≤ 20% |
| Copper | 75 - 125 | 80 - 120 | ≤ 20% |
| Iron | 75 - 125 | 80 - 120 | ≤ 20% |
| Lead | 75 - 125 | 80 - 120 | ≤ 20% |
| Magnesium | 75 - 125 | 80 - 120 | ≤ 20% |
| Manganese | 75 - 125 | 80 - 120 | ≤ 20% |
| Mercury | 75 - 125 | 80 - 120 | ≤ 20% |
| Nickel | 75 - 125 | 80 - 120 | ≤ 20% |
| Potassium | 75 - 125 | 80 - 120 | ≤ 20% |
| Selenium | 75 - 125 | 80 - 120 | ≤ 20% |
| Silica | 75 - 125 | 80 - 120 | ≤ 20% |
| Silver | 75 - 125 | 80 - 120 | ≤ 20% |
| Sodium | 75 - 125 | 80 - 120 | ≤ 20% |
| Strontium | 75 - 125 | 80 - 120 | ≤ 20% |
| Thallium | 75 - 125 | 80 - 120 | ≤ 20% |
| Vanadium | 75 - 125 | 80 - 120 | ≤ 20% |
| Zinc | 75 - 125 | 80 - 120 | ≤ 20% |



Spike Recovery Control Limits - Analysis of PCB / Aroclors in Soil & Sediment Samples - EPA SW-846 Method 8082

Effective 5/1/09

Control limits are updated periodically. Assure that you have ARI's current control limits by downloading the files at the time of use. <http://www.arilabs.com/portal/downloads/ARI-CLs.zip>

| | Routine Analysis | PSDDA | Low Level | Low level | Soxhlet Extraction | Medium Level |
|--|------------------|----------|-----------------|-----------|-----------------------|--------------|
| Typical Reporting Limit (µg/kg): | 33 | 20 | 10 | 4 | 100 | 800 |
| Nominal Sample Wet Weight (g): | 12 | 25 | 25 | 25 | 10 | 5 |
| Final Extract Volume (mL): | 4 | 5 | 2.5 | 1 | 10 | 40 |
| LCS Spike Recovery ^(1,2) | | | | | | |
| Aroclor 1016 | 48 - 106 | 52 - 101 | 53 - 100 | 37 - 106 | 30 - 160 ³ | 59 - 108 |
| Aroclor 1260 | 50 - 121 | 52 - 126 | 58 - 112 | 50 - 116 | 30 - 160 ³ | 43 - 177 |
| | | | | | | |
| Method Blank / LCS Surrogate Recovery | | | | | | |
| Tetrachloro- <i>meta</i> -xylene (TCMX) | 46 - 111 | 47 - 110 | 43 - 108 | 35 - 100 | 30 - 160 ³ | 49 - 110 |
| Decachlorobiphenyl | 51 - 112 | 48 - 119 | 48 - 118 | 40 - 109 | 30 - 160 ³ | 51 - 127 |
| | | | | | | |
| Sample Surrogate Recovery | | | | | | |
| Tetrachloro- <i>meta</i> -xylene (TCMX) | 50 - 114 | 46 - 113 | 35 - 119 | 38 - 102 | 30 - 160 ³ | 28 - 106 |
| Decachlorobiphenyl | 42 - 127 | 40 - 130 | 33 - 143 | 34 - 141 | 30 - 160 ³ | 22 - 168 |

(1) Laboratory Control Sample (LCS) spike recovery control limits also used as advisory control limits for sample matrix spike (MS) analyzes. MS recovery values are advisory and not used to assess the acceptability of an analytical batch.

(2) Highlighted control limits (**bold font**) adjusted to demonstrate that ARI does not use control limits < 10 for the lower limit or < 100 for the upper limit.

(3) 30 – 160 are default, advisory control limits used when there is insufficient data to calculate historic control limits. **DO NOT** use these limits as the sole reason to reject the data from a batch of analyses.

Data Summary Package

**prepared
for**

The Boeing Company

Project: BP2 Source Control,

ARI JOB NO: QT80

**prepared
by**

Analytical Resources, Inc.

PCB ANALYSIS

Sample ID: PL2SC-SS-J505A-042210
SAMPLE

Lab Sample ID: QT80A
LIMS ID: 10-10136
Matrix: Filter
Data Release Authorized: *JB*
Reported: 05/03/10

QC Report No: QT80-The Boeing Company
Project: BP2 Source Control

Date Sampled: 04/22/10
Date Received: 04/22/10

Date Extracted: 04/26/10
Date Analyzed: 05/01/10 03:16
Instrument/Analyst: ECD7/YZ
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes

Sample Amount: 1.00 Filter
Final Extract Volume: 5.0 mL
Dilution Factor: 10.0
Silica Gel: Yes

| CAS Number | Analyte | RL | Result |
|------------|--------------|-----|---------|
| 12674-11-2 | Aroclor 1016 | 5.0 | < 5.0 U |
| 53469-21-9 | Aroclor 1242 | 5.0 | < 5.0 U |
| 12672-29-6 | Aroclor 1248 | 7.4 | < 7.4 Y |
| 11097-69-1 | Aroclor 1254 | 5.0 | 12 |
| 11096-82-5 | Aroclor 1260 | 5.0 | 11 |
| 11104-28-2 | Aroclor 1221 | 5.0 | < 5.0 U |
| 11141-16-5 | Aroclor 1232 | 5.0 | < 5.0 U |

Reported in Total µg

PCB Surrogate Recovery

| | |
|-----------------------|-------|
| Decachlorobiphenyl | 82.5% |
| Tetrachlorometaxylene | 76.0% |

SW8082/PCB SURROGATE RECOVERY SUMMARY

Matrix: Filter

QC Report No: QT80-The Boeing Company
Project: BP2 Source Control

| <u>Client ID</u> | <u>DCBP</u> | <u>TCMX</u> | <u>TOT OUT</u> |
|-----------------------|-------------|-------------|----------------|
| MB-042610 | 83.5% | 71.5% | 0 |
| LCS-042610 | 83.2% | 73.5% | 0 |
| LCSD-042610 | 85.2% | 71.8% | 0 |
| PL2SC-SS-J505A-042210 | 82.5% | 76.0% | 0 |

| | LCS/MB LIMITS | QC LIMITS |
|--------------------------------|----------------------|------------------|
| (DCBP) = Decachlorobiphenyl | (30-160) | (30-160) |
| (TCMX) = Tetrachlorometaxylene | (30-160) | (30-160) |

Prep Method: SW3580A
Log Number Range: 10-10136 to 10-10136

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082
Page 1 of 1

Sample ID: LCS-042610
LCS/LCSD

Lab Sample ID: LCS-042610
LIMS ID: 10-10136
Matrix: Filter
Data Release Authorized: *B*
Reported: 05/03/10

QC Report No: QT80-The Boeing Company
Project: BP2 Source Control

Date Sampled: 04/22/10
Date Received: 04/22/10

Date Extracted LCS/LCSD: 04/26/10

Sample Amount LCS: 1.00 Filter
LCSD: 1.00 Filter

Date Analyzed LCS: 05/01/10 02:29
LCSD: 05/01/10 02:52

Final Extract Volume LCS: 5.0 mL
LCSD: 5.0 mL

Instrument/Analyst LCS: ECD7/YZ
LCSD: ECD7/YZ

Dilution Factor LCS: 1.00
LCSD: 1.00

GPC Cleanup: No
Sulfur Cleanup: Yes

Silica Gel: Yes
Acid Cleanup: Yes

| Analyte | LCS | Spike Added-LCS | LCS Recovery | LCSD | Spike Added-LCSD | LCSD Recovery | RPD |
|--------------|-----|--------------------|-----------------|------|---------------------|------------------|------|
| Aroclor 1016 | 2.6 | 2.5 | 104% | 2.7 | 2.5 | 108% | 3.8% |
| Aroclor 1260 | 2.3 | 2.5 | 92.0% | 2.3 | 2.5 | 92.0% | 0.0% |

PCB Surrogate Recovery

| | LCS | LCSD |
|-----------------------|-------|-------|
| Decachlorobiphenyl | 83.2% | 85.2% |
| Tetrachlorometaxylene | 73.5% | 71.8% |

Reported in Total µg
RPD calculated using sample concentrations per SW846.

4
PCB METHOD BLANK SUMMARY

BLANK NO.

QT80MB1


| | |
|-------------------------------------|-----------------------------|
| Lab Name: ANALYTICAL RESOURCES, INC | Client: THE BOEING COMPANY |
| ARI Job No.: QT80 | Project: BP2 SOURCE CONTROL |
| Lab Sample ID: QT80MB1 | Lab File ID: 0430A030 |
| Date Extracted: 04/26/10 | Matrix: SOLID |
| Date Analyzed: 05/01/10 | Instrument ID: ECD7 |
| Time Analyzed: 0205 | GC Columns: ZB5/ZB35 |

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

| | CLIENT SAMPLE NO. ===== | LAB SAMPLE ID ===== | DATE ANALYZED ===== |
|----|-------------------------------|---------------------------|---------------------------|
| 01 | QT80LCS1 | QT80LCS1 | 05/01/10 |
| 02 | QT80LCSD1 | QT80LCSD1 | 05/01/10 |
| 03 | PL2SC-SS-J505A-0422 | QT80A | 05/01/10 |

ALL RUNS ARE DUAL COLUMN

Sample ID: MB-042610
METHOD BLANK

Lab Sample ID: MB-042610
LIMS ID: 10-10136
Matrix: Filter
Data Release Authorized: 
Reported: 05/03/10

QC Report No: QT80-The Boeing Company
Project: BP2 Source Control

Date Sampled: NA
Date Received: NA

Date Extracted: 04/26/10
Date Analyzed: 05/01/10 02:05
Instrument/Analyst: ECD7/YZ
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes

Sample Amount: 1.00 Filter
Final Extract Volume: 5.0 mL
Dilution Factor: 1.00
Silica Gel: Yes

| CAS Number | Analyte | RL | Result |
|------------|--------------|-----|---------|
| 12674-11-2 | Aroclor 1016 | 0.5 | < 0.5 U |
| 53469-21-9 | Aroclor 1242 | 0.5 | < 0.5 U |
| 12672-29-6 | Aroclor 1248 | 0.5 | < 0.5 U |
| 11097-69-1 | Aroclor 1254 | 0.5 | < 0.5 U |
| 11096-82-5 | Aroclor 1260 | 0.5 | < 0.5 U |
| 11104-28-2 | Aroclor 1221 | 0.5 | < 0.5 U |
| 11141-16-5 | Aroclor 1232 | 0.5 | < 0.5 U |

Reported in Total µg

PCB Surrogate Recovery

| | |
|-----------------------|-------|
| Decachlorobiphenyl | 83.5% |
| Tetrachlorometaxylene | 71.5% |

METALS ANALYSIS

INORGANICS ANALYSIS DATA SHEET

TOTAL METALS

Page 1 of 1

Sample ID: PL2SC-SS-J505A-042210

SAMPLE

Lab Sample ID: QT80B

LIMS ID: 10-10137

Matrix: Soil

Data Release Authorized

Reported: 05/06/10

QC Report No: QT80-The Boeing Company

Project: BP2 Source Control

Date Sampled: 04/22/10

Date Received: 04/22/10

Percent Total Solids: 15.0%

| Prep Meth | Prep Date | Analysis Method | Analysis Date | CAS Number | Analyte | RL | mg/kg-dry | Q |
|--------------|--------------|--------------------|------------------|------------|----------|-----|-----------|---|
| 3050B | 04/22/10 | 200.8 | 05/05/10 | 7440-38-2 | Arsenic | 1 | 11 | |
| 3050B | 04/22/10 | 6010B | 04/28/10 | 7440-43-9 | Cadmium | 1 | 4 | |
| 3050B | 04/22/10 | 6010B | 04/28/10 | 7440-47-3 | Chromium | 3 | 164 | |
| 3050B | 04/22/10 | 6010B | 04/28/10 | 7440-50-8 | Copper | 1 | 414 | |
| 3050B | 04/22/10 | 200.8 | 05/05/10 | 7439-92-1 | Lead | 6 | 307 | |
| CLP | 04/22/10 | 7471A | 04/23/10 | 7439-97-6 | Mercury | 0.1 | 0.4 | |
| 3050B | 04/22/10 | 6010B | 04/28/10 | 7440-22-4 | Silver | 2 | 2 | U |
| 3050B | 04/22/10 | 6010B | 04/28/10 | 7440-66-6 | Zinc | 6 | 1,990 | |

U-Analyte undetected at given RL

RL-Reporting Limit

INORGANICS ANALYSIS DATA SHEET

TOTAL METALS


Page 1 of 1

Sample ID: METHOD BLANK

Lab Sample ID: QT80MB

LIMS ID: 10-10137

Matrix: Soil

Data Release Authorized: 

Reported: 05/06/10

QC Report No: QT80-The Boeing Company

Project: BP2 Source Control

Date Sampled: NA

Date Received: NA

Percent Total Solids: NA

| Prep Meth | Prep Date | Analysis Method | Analysis Date | CAS Number | Analyte | RL | mg/kg-dry | Q |
|-----------|-----------|-----------------|---------------|------------|----------|------|-----------|---|
| 3050B | 04/22/10 | 200.8 | 05/05/10 | 7440-38-2 | Arsenic | 0.2 | 0.2 | U |
| 3050B | 04/22/10 | 6010B | 04/28/10 | 7440-43-9 | Cadmium | 0.2 | 0.2 | U |
| 3050B | 04/22/10 | 6010B | 04/28/10 | 7440-47-3 | Chromium | 0.5 | 0.5 | U |
| 3050B | 04/22/10 | 6010B | 04/28/10 | 7440-50-8 | Copper | 0.2 | 0.2 | U |
| 3050B | 04/22/10 | 200.8 | 05/05/10 | 7439-92-1 | Lead | 1 | 1 | U |
| CLP | 04/22/10 | 7471A | 04/23/10 | 7439-97-6 | Mercury | 0.02 | 0.02 | U |
| 3050B | 04/22/10 | 6010B | 04/28/10 | 7440-22-4 | Silver | 0.3 | 0.3 | U |
| 3050B | 04/22/10 | 6010B | 04/28/10 | 7440-66-6 | Zinc | 1 | 1 | U |

U-Analyte undetected at given RL

RL-Reporting Limit

INORGANICS ANALYSIS DATA SHEET

TOTAL METALS


Page 1 of 1

Sample ID: LAB CONTROL

Lab Sample ID: QT80LCS

LIMS ID: 10-10137

Matrix: Soil

Data Release Authorized: 

Reported: 05/06/10

QC Report No: QT80-The Boeing Company

Project: BP2 Source Control

Date Sampled: NA

Date Received: NA

BLANK SPIKE QUALITY CONTROL REPORT

| Analyte | Analysis Method | Spike Found | Spike Added | % Recovery | Q |
|----------|-----------------|-------------|-------------|------------|---|
| Arsenic | 200.8 | 24.9 | 25.0 | 99.6% | |
| Cadmium | 6010B | 49.9 | 50.0 | 99.8% | |
| Chromium | 6010B | 49.7 | 50.0 | 99.4% | |
| Copper | 6010B | 47.8 | 50.0 | 95.6% | |
| Lead | 200.8 | 26 | 25 | 104% | |
| Mercury | 7471A | 0.46 | 0.50 | 92.0% | |
| Silver | 6010B | 52.1 | 50.0 | 104% | |
| Zinc | 6010B | 50 | 50 | 100% | |

Reported in mg/kg-dry

N-Control limit not met

NA-Not Applicable, Analyte Not Spiked

Control Limits: 80-120%

TOTAL SOLIDS



Organic Extractions Laboratory Analyst Notes

ARI Job No.: QT84

Client ID: The Boeing Company

Parameter: PCB

Client Project: BPA Source Control

SOP Number(s):

No Anomalies:

List problems, concerns, corrective actions and any other pertinent information

Prep time (Before Drying) 20 min

Prep Time (After Drying) 45 min

Sample Wet Weight. $A = 606.11g$

Metals split (Solids only) $A = 14.59g$

Dry Weight (w/ Plastic Ring) $A = 180.68$

Plastic Ring Weight. $A = 8.42$

Dry Weight (extraction weight) without Plastic Ring $A = 172.20$

GC analyst, sample was surrogate at 5X normal level to leave room for possible dilutions. ~~5/1~~ 4/26/14

extract A - High Volume Acid Cleaned

Analyst Initials:

Date:

Solids Data Entry Report
Date: 04/23/10

Checked by: KM Date: 4/23/10
Data Analyst: DM

Solids Determination performed on 04/22/10 by DM

| JOB | SAMPLE | CLIENTID | TAREWEIGHT | SAMPDISH | DRYWEIGHT | SOLIDS |
|------|--------|---------------------|------------|----------|-----------|--------|
| QT80 | B | PL2SC-SS-J505A-0422 | 0.939 | 5.248 | 1.586 | 15.02 |

Total Solids Bench Sheet

Laboratory Section metals

Oven Identification: 07

Balance ID: 068755

Samples in Oven: Date: 4-22-10 Time: 1505 Temp: 103°C Analyst: DM

Removed from Oven: Date: 4-23-10 Time: 0925 Temp: 101°C Analyst: DM

Source of Total Solids Data If From A Different Lab:

4-23-10

[illegible]

1) Place a check mark in this column if samples have dried > 12 but < 24 hours. When samples have been at 104°C < 12 hours, constant weight must be verified as described in SOP 10023S. Use a 2nd bench sheet for additional weightings.

ATTACHMENT C
DATA VALIDATION REPORT
PROVIDED ON CD

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TECHNICAL MEMORANDUM

Date: 5/13/2010
To: Will Ernst
From: Kate McPeck, Environmental Scientist
cc: Liz Shea and Ted Norton, GAI
Project No.: 013-1646-010.600.01
Company: The Boeing Company
Email: kmcpeek@golder.com
RE: **BOEING PLANT 2 – STORMWATER SOURCE CONTROL SAMPLING ROUND 4 (11/2009-4/2010) DATA VALIDATION QA/QC REVIEW**

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1.0 INTRODUCTION

A total of eight stormwater samples including a field duplicate, seven filter bag samples, eight equipment blank samples, and one bentonite chips sample were collected November 2009 through April 2010. This sampling was conducted as part of the 1994 Administrative Order on Consent between Boeing and EPA Region X and details are specified in the *Revised Stormwater Source Control Work Plan – Attachment A – Sampling and Analysis Plan* (Golder and Floyd| Snider, 2007). The purpose of the stormwater sampling is to identify potential sources and extent of contamination to the Duwamish Waterway. Samples were analyzed by Analytical Resources Incorporated (ARI) of Tukwila, Washington for the following parameters:

- Semivolatile organic compounds (SVOC) by EPA Method 8270D GC/MS
- Polynuclear Aromatic Hydrocarbons (PNAs) by EPA Method 8270D GC/MS SIM
- Polychlorinated biphenyls (PCBs) by EPA Method 8082
- Metals (Arsenic, Cadmium, Chromium, Copper, Mercury, Lead, Silver, and Zinc) by EPA Methods 6010B, 7000 Series, and 200.8.
- pH by EPA Method 150.1.

Samples were analyzed in accordance with procedures described in *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (USEPA SW-846, 3rd edition) 8270D, 8270D-SIM, 8082, 6010B, 7060, 7421, 7470, and EPA Method 200.8, Revision 5.5; Determination of Trace Elements in Water and Wastes by Inductively Coupled Plasma-Mass Spectrometry.*

2.0 SAMPLE DELIVERY GROUPS, SAMPLES AND ANALYSES

Samples were analyzed and data were reported by the laboratory in batch numbers/sample delivery groups (SDGs) as summarized below:

PW89 (SVOCs, PNAs, and Dissolved Metals) and PW88 (Dissolved Low Level Mercury):

PL2SC-W-V-110909 PL2SC-W-DUP-110909 PL2SC-W-G-110909

PX33 (PCBs and Dissolved Metals) and PX30 (Dissolved Low Level Mercury):

PL2SC-W-EB1-111209

PX46 (Dissolved Metals) and PX47 (Dissolved Low Level Mercury):

PL2SC-W-J249-111309

PY96 (PCBs and Dissolved Metals) and PY97 (Dissolved Low Level Mercury):

PL2SC-W-EB3-112309

QC17 (PCBs and Dissolved Metals) and QC18 (Dissolved Low Level Mercury):

PL2SC-EB2-121809

QE75 (PCBs and Metals):

PL2SC-SS-J249-010810

QF18 (PCBs and Dissolved Metals) and QF21 (Dissolved Low Level Mercury):

PL2SC-EB1-011210

QI23 (Dissolved Metals and pH) and QI24 (Dissolved Low Level Mercury):

PL2SC-W-J505A-020310

QI75 (PCBs and Metals):

PL2SC-SS-I-020510

QI78 (PCBs and Dissolved Metals) and QI90 (Dissolved Low Level Mercury):
PL2SC-EB3-020510

QJ96 (Dissolved Metals and pH) and QJ98 (Dissolved Low Level Mercury):
PL2SC-W-B-021210

QL59 (Dissolved Metals and pH) and QL62 (Dissolved Low Level Mercury):
PL2SC-W-Z-022610

QM32 (PCBs and Metals):
PL2SC-SS-Z-03032010

QM43 (PCBs and Dissolved Metals) and QM45 (Dissolved Low Level Mercury):
PL2SC-EB2-030310

QO78 (PCBs and Metals):
PL2SC-SS-J505A-030910 PL2SC-BE1-030910

QQ03 (PCBs and Dissolved Metals) and QQ02 (Dissolved Low Level Mercury):
PL2SC-EB1-032610

QQ28 (Dissolved Metals and pH) and QQ32 (Dissolved Low Level Mercury):
PL2SC-W-A-032910

QR17 (Metals):
PL2SC-SS-A-040210

QR83 and QU55 (PCBs and Metals):
PL2SC-SS-B-040710

QS55 (PCBs and Dissolved Metals) and QS56 (Dissolved Low Level Mercury):
PL2SC-EB3-041310

QT80 (PCBs and Metals):
PL2SC-SS-J505A-042210

Quality assurance/quality control (QA/QC) reviews of laboratory data were performed in the laboratory in accordance with the laboratory quality assurance program plan. The data validation QA/QC review focused primarily on laboratory result summary sheets and quality control summary sheets to ensure that work plan data quality objectives were met for the project. Data validation was conducted in accordance with the criteria outlined in the National Functional Guidelines for Organic Data Review (EPA 1999) and the National Functional Guidelines for Inorganic Data Review (EPA 2004), modified to include method specific requirements of the laboratory analytical methods. Raw data sheets were reviewed as necessary to confirm conditions reported and to support application of qualifiers to analytical results.

The validation level specified in the *Revised Stormwater Source Control Work Plan – Attachment A - Sampling and Analysis Plan* (SAP) is a Level 1 which is considered a basic review. Level 2, a more detailed (per SAP Tables 4-7) validation was performed per Golder's request (April 4, 2007). The following is a summary of quality control elements associated with each analytical fraction and the status of that element as a result of the data validation process.

3.0 SAMPLING, DOCUMENTATION AND REPORTING

Sample acknowledgements, chain-of-custody, request forms, and data package completeness were evaluated with the following noted:

- It was noted during review of the SAP that various compounds were not analyzed or did not meet requested reporting limits for SVOCs and PNAs. In some cases action levels were set to the laboratory RL, as laboratory RLs were greater than National Recommended Water Quality Criteria for Priority Toxic Pollutants (NRWQC) criteria.
- Table 7 of the SAP specifies that ARI sufficiently demonstrate analyst capability and method detection limit (MDL) studies for EPA Methods 8270D and 8270D SIM. ARI's Laboratory Quality Assurance Plan (LQAP) specifies standard operating procedures and other elements of ARI's training program. Internal and/or external performance evaluation samples are used periodically to assess staff competency. Unacceptable results or insufficient number of performance evaluation samples will result in remedial or additional training as specified in ARI's LQAP. ARI MDL studies are performed and calculated in accordance with 40 CFR Part 136, Appendix B and are periodically updated as necessary and/or according to regulatory requirements.
- Various SDGs: Recorded cooler temperatures occasionally exceeded the recommended temperature ($4^{\circ}\text{C} \pm 2^{\circ}\text{C}$) for sample preservation. No action was taken since the samples are delivered to the laboratory on the same day as sample collection.
- SDGs QL59 and QQ32: pH analysis was requested since the field meter was not in working order on the day of sample collection. The data validator performed a cursory review of the sample results and found that transcriptions and associated QC were in control. The recommended hold time for pH analysis is 15 minutes. These samples were not analyzed within 15 minutes of sample collection, as noted in the laboratory case narrative. No action was taken except to note.
- SDGs QE75, QI75, QM32, QO78, QR17, QR83, QU55 and QT80: Filter bag samples (also referred to as suspended solids) were collected over extended periods of time (a one to two week period or longer when necessary) and were "collected" on a given day. Chain of custody date represents the date that the filter bag was removed from the system and submitted to the lab. Filter bag samples were analyzed for PCBs and metals.
- SDG PX33/PX30: Equipment blank (PL2SC-W-EB1-111209) corresponds to the water sample in SDG PX46/PX47 and the filter bag sample in SDG QE75.
- SDG PY96/PY97: Equipment blank (PL2SC-W-EB3-112309) corresponds to the filter bag sample in SDG QI75.
- SDG QC17/QC18: Equipment blank (PL2SC-EB2-121809) corresponds to the water sample in SDG QL59/QL61 and the filter bag sample in SDG QM32.
- SDG QF18/QF21: Equipment blank (PL2SC-EB1-011210) corresponds to the water sample in SDG QI23/QI24 and the filter bag sample in SDG QO78.
- SDG QI78/QI90: Equipment blank (PL2SC-EB3-020510) corresponds to the water sample in SDG QJ96/QJ98 and the filter bag sample in SDG QR83/QU55.

- SDG QM43/QM45: Equipment blank (PL2SC-EB2-030310) corresponds to the water sample in SDG QQ28/QQ32 and the filter bag sample in SDG QR17.
- SDG QQ02/QQ03: Equipment blank (PL2SC-EB1-032610) does not correspond to any samples. After this equipment blank was collected the sampler was found damaged. A new equipment blank (SDG QS55/QS56) was collected for the replacement sampler and sampling proceeded.
- SDG QS55/QS56: Equipment blank (PL2SC-EB3-041310) corresponds to the filter bag sample in SDG QT80.
- Field duplicates were not collected for suspended solids since filter bag samples are collected over an extended time period making duplicate collection impossible.

4.0 SEMIVOLATILE ORGANIC COMPOUNDS

The laboratory provided a full data package for the SVOC analyses. The items reviewed during validation are summarized below.

4.1 Analytical Methods – *acceptable*

Samples for SVOC analysis were analyzed by gas chromatography/mass spectrometry (GC/MS) using EPA SW846 Method 8270D.

4.2 Sample Holding Times – *acceptable*

All water samples were extracted within seven days of sample collection and analyzed within 40 days of extraction.

4.3 Laboratory Reporting Limits

The laboratory achieved the RLs required by the approved SAP (Golder and Floyd|Snider, 2007) with the following exceptions:

- SDG PW89: Thirteen target compounds: aniline, azobenzene, benzidine, 1,4-dioxane, retene, tributyl phosphate, triphenyl phosphate, alpha-terpineol, butyl diphenyl phosphate, butylatedhydroxytoluene, dibutyl phenyl phosphate, pyridine, and n-nitrosodimethylamine were not analyzed as requested on Table 3 of the SAP.
- SDG PW89: Water reporting limits for target compounds 2,4,6-trichlorophenol, 2,4-dinitrotoluene, 3,3'-dichlorobenzidine, bis-(2-chloroethyl)ether, hexachlorobenzene, nitroso-di-n-propylamine, and pentachlorophenol were higher (by a factor of 10X) than requested because they were analyzed via GC/MS instead of GC/MS SIM as requested on Table 3 of the SAP. For these eight compounds, the action levels are less than the RLs:

| Compound | SAP Reporting Limit (µg/L) | PW89 Reporting Limit (µg/L) | Action Level (µg/L) |
|--------------------------|----------------------------|-----------------------------|---------------------|
| 2,4,6-trichlorophenol | 0.5 | 5 | 2.4 |
| 2,4-dinitrotoluene | 0.5 | 5 | 3.4 |
| 3,3'-dichlorobenzidine | 0.5 | 5 | 0.5 |
| bis-(2-chloroethyl)ether | 0.1 | 1 | 0.53 |
| hexachlorobenzene | 0.1 | 1 | 0.1 |
| nitroso-di-n-propylamine | 0.5 | 5 | 0.51 |
| pentachlorophenol | 0.5 | 5 | 3 |

4.4 Instrument Calibration and Tuning

A review of the instrument calibration, calibration frequency, and tuning was performed. All of the calibration criteria for the target analytes as listed on Table 7 of the SAP were met with the following exceptions for continuing calibration verifications:

- SDG PW89: The ccal percent difference for compounds 2,2-oxybis(1-Chloropropane) and Butylbenzylphthalate were out of control high. The sample was a non-detect for these compounds and was qualified UJ to indicate an estimated value.
- SDG PW89: The ccal percent difference for compounds Hexachlorobutadiene, 2,4-Dinitrophenol and Hexachlorocyclopentadiene were out of control low. The sample was a non-detect for these compounds and was qualified UJ to indicate an estimated value.

4.5 Internal Standards Recovery – acceptable

Internal standard areas and retention times for all field samples, associated quality control, and calibration data were within established quality control limits.

4.6 Blank Contamination – acceptable

The method blanks were free of contamination.

4.7 Surrogate Recovery – acceptable

All surrogate recoveries were within control limits.

4.8 Matrix Spike Compound Recovery

MS/MSD analyses were not performed. Refer to LCS/LCSD results for a measure of precision and accuracy.

4.9 Laboratory Control Sample Recovery

Laboratory control/laboratory control duplicate samples (LCS/LCSD) were evaluated using ARI control limits. LCS/LCSD percent recoveries and RPDs were acceptable and within specified criteria with the following exception:

- Compounds bis(2-Chloroethoxy) Methane, 4-Chloroaniline, Hexachlorocyclopentadiene, Acenaphthylene, 4-Nitroaniline, N-Nitrosodiphenylamine, Carbazole, and 3,3'-Dichlorobenzidine were out of control low for the LCS. The LCSD was in control for all except Hexachlorocyclopentadiene. No action was required since the LCSD was in

control and Hexachlorocyclopentadiene was already qualified due to the continuing calibration verification issue.

4.10 Field Duplicate Sample Analysis

Field duplicate samples were not collected and analyzed for SVOCs due to reasons (limited volume and high variability) described in Section 3.1.4 of the approved SAP.

5.0 POLYNUCLEAR AROMATIC HYDROCARBONS

The laboratory provided a full data package for PNA analysis. The items reviewed during validation are summarized below.

5.1 Analytical Methods – *acceptable*

Samples for PNA analysis were analyzed by selected ion monitoring (SIM) GC/MS using EPA SW846 Method 8270D SIM.

5.2 Sample Holding Times – *acceptable*

All water samples were extracted within seven days of sample collection and analyzed within 40 days of extraction.

5.3 Laboratory Reporting Limits

The laboratory achieved the RLs required by the approved SAP (Golder and Floyd|Snider, 2007) with the following exception:

- SDG PW89: Nine target compounds 2,4,6-trichlorophenol, 2,4-dinitrotoluene, 3,3'-dichlorobenzidine, benzidine, bis-(2-chloroethyl)ether, hexachlorobenzene, n-nitrosodimethylamine, nitroso-di-n-propylamine, and pentachlorophenol were not analyzed via EPA Method 8270D SIM as stipulated on Table 3 of the SAP. Seven of the nine target compounds listed above were analyzed by EPA Method 8270D, but the requested reporting limits were not met (see section 4.3 above for details). The remaining two target compounds (benzidine and n-nitrosodimethylamine) were not analyzed by the lab (see section 4.3 above). No action required since these compounds are not analyzed by 8270D SIM, thus the method was listed incorrectly in the SAP.

5.4 Instrument Calibration and Tuning

A review of the instrument calibration, calibration frequency, and tuning was performed. All of the calibration criteria for the target analytes as listed on Table 7 of the SAP were met with the following exception:

- SDG PW89: Naphthalene, 2-Methylnaphthalene, 1-Methylnaphthalene, Acenaphthylene, and Dibenzofuran were out of control or not recovered in the initial calibration verification (ICV). No action was required since the rest of the calibration parameters were in control.

5.5 Internal Standards Recovery – *acceptable*

Internal standard areas and retention times for all field samples, associated quality control, and calibration data were within established quality control limits.

5.6 Blank Contamination – *acceptable*

The method blanks were free of contamination.

5.7 Surrogate Recovery – *acceptable*

All surrogate recoveries were within control limits.

5.8 Matrix Spike Analysis

MS/MSD analyses were not performed. Refer to LCS/LCSD results for a measure of precision and accuracy.

5.9 Laboratory Control Sample Recovery

LCS/LCSDs were evaluated using ARI control limits. LCS/LCSD percent recoveries and RPDs were acceptable and within specified criteria with the following exception:

- SDG PW89: Benzo(a)pyrene was out of control low for the LCSD. No action was required since the LCS was in control.

5.10 Field Duplicate Sample Analysis

Field duplicate samples were not collected and analyzed for PNAs due to reasons (limited volume and high variability) described in Section 3.1.4 of the SAP.

6.0 POLYCHLORINATED BIPHENYLS

The laboratory provided a full data package for PCB analysis. The items reviewed during validation are summarized below.

6.1 Analytical Methods – *acceptable*

Samples for PCB analysis were analyzed by GC/MS using EPA SW846 Method 8082.

6.2 Sample Holding Times and Preservations – *acceptable*

All samples were extracted within 14 days of sample collection for solids (within seven days for waters) and analyzed within 40 days from the date of extraction.

6.3 Reporting

The following sampling, documentation and reporting discrepancies were noted:

- SDG PX33: The case narrative stated that sample PL2SC-W-EB1-111209 was analyzed on 11/7/09. This sample was actually analyzed on 11/17/09. No action was taken except to note.
- SDG QC17: The full data package for PCB analysis sent by the laboratory included calibration data for a client other than Boeing. ARI was contacted about this error. No further action was taken.
- SDG QI78: The case narrative stated that sample PL2SC-EB3-020510 was received on 2/3/2010 when it was actually received on 2/5/2010. ARI was contacted and the laboratory issued a revised case narrative.
- SDGs QM32 and QO78: In certain cases the laboratory assigned a P qualifier to Aroclor result(s) to indicate that the analyte was detected on both chromatographic columns but the quantified values differed by $\geq 40\%$ RPD with no obvious chromatographic

interference. In these cases a J qualifier was added by the data validator to emphasize that the result was estimated.

6.4 Laboratory Reporting Limits

The laboratory achieved the RLs required by the SAP with the following exceptions:

- The reporting limits were not met in cases in which the samples were analyzed at dilutions due to high concentrations of target compounds.
- SDGs QE75, QI75, QM32, QR83 and QT80: In certain cases the laboratory assigned a Y qualifier to Aroclor result(s) to indicate that the analyte was not detected at or above the reported concentration and the reporting limit is raised due to chromatographic interference. The Y flag is equivalent to the U flag with a raised reporting limit. In these cases a UY qualifier was added by the data validator to emphasize that while the detection limit was elevated, PCBs were not detected at the elevated level.

6.5 Instrument Calibration

A review of the instrument calibration was performed. All of the calibration criteria were met with the following exceptions:

- It should be noted that the approved SAP (Golder and Floyd|Snider, 2007) indicates that CCVs should be performed every six samples and at the end of the analytical sequence. While USEPA Method 8082 (December 1996) *recommends* that a calibration standard be performed after each group of 10 samples the method *requires* that a calibration standard must be analyzed after each group of 20 samples. Calibration standard analysis frequency was performed according to USEPA Method 8082 criteria.
- Various SDGs: In some cases ICVs were listed as having a true value of 250 ppb but were actually spiked at 1200 ppb or 1250 ppb. This was clarified with ARI and no further action was taken.
- SDG QI75: The case narrative from ARI states that the closing CCV was out of control low on the second column for Aroclor 1248 and 1260. The CCV was reanalyzed, resulting in Aroclor 1248 in control and Aroclor 1260 still out of control low. The first column was in control for both analyses. ARI was contacted for clarification since the failing CCVs could not be found in the raw data package and it was unclear if data were reported from the failing column. The laboratory stated that the failing CCVs were not included because the CCV was immediately reanalyzed and was in control. Data were reported from the failing column because it had a higher value and the software automatically reports from the column with higher values. No further action was taken except to note.

6.6 Internal Standards Recovery – acceptable

Internal standard areas and retention times for all field samples, associated quality control, and calibration data were within established quality control limits.

6.7 Blank Contamination – acceptable

The method blanks and equipment blanks were free of contamination.

6.8 Surrogate Recovery

All surrogate recoveries were within control limits with the following exceptions:

| SDG | Sample ID | Issue | Qualifier | Reason |
|------|----------------------|---|-----------|--|
| PY96 | PL2SC-W-EB3-112309 | Surrogate DCBP ≥40% RPD between two columns | n/a | No action other than to note. |
| QE75 | PL2SC-SS-J249-010810 | Surrogates DCBP and TCMX diluted out of sample. | n/a | No action other than to note. Analyst notes state that the matrix was oily. |
| QI75 | PL2SC-SS-I-020510 | Surrogates DCBP and TCMX diluted out of sample. | n/a | No action other than to note. |

6.9 Matrix Spike Analysis

Matrix spike and matrix spike duplicate analyses were not performed on suspended solids or stormwater samples due to reasons (limited volume and high variability) described in Section 3.1.4 of the SAP. Refer to LCS/LCSD results for a measure of precision and accuracy.

6.10 Laboratory Control Sample Recovery

LCSs were evaluated using ARI's control limit criteria. It should be noted that Table 4 of the SAP specifies PCB acceptance criteria for solids. ARI control limit criteria are as stringent if not more stringent than the limits specified in Table 4. LCS/LCSD percent recoveries and RPDs were acceptable and within specified criteria with the following exceptions:

- SDG QO78: LCS and LCSD for Aroclor 1016 were out of control high for sample PL2SC-SS-J505A-030910. No action was taken since the sample was a non-detect for this analyte.
- SDG QO78: LCS for Aroclor 1016 was out of control high for sample PL2SC-BE1-030910. No action was taken since the sample was a non-detect for this analyte and the LCSD and CCALs were in control.
- SDG QR83: LCS for Aroclor 1016 was out of control high for sample PL2SC-SS-B-040710. No action was taken since the sample was a non-detect for this analyte and the LCSD and CCALs were in control.

6.11 Field Duplicate Sample Analysis

Field duplicate samples were not collected and analyzed for PCBs due to reasons (limited volume and high variability) described in Section 3.1.4 of the SAP.

7.0 INORGANICS

The laboratory provided a full data package for inorganics analysis. Items reviewed during validation are summarized below.

7.1 Analytical Methods – *acceptable*

Samples for total and dissolved metals analysis were prepared using EPA Methods 200.8, 6010B, 3050B or acid digestion. Metals analysis was completed by EPA Methods 6010B, 7471A and 200.8. Samples for trace mercury analysis were analyzed by cold vapor atomic absorption spectrometry (CVAA) using EPA Method 7470A.

7.2 Sample Holding Times – *acceptable*

All samples were prepared and analyzed within the recommended holding period from the date of collection; 180 days for metals and 28 days for mercury. All holding time criteria were met.

7.3 Reporting

The following reporting discrepancy was noted:

- SDG QM45: The case narrative originally stated an incorrect date of digestion for dissolved low level mercury analysis. ARI was contacted and the laboratory issued a revised case narrative.

7.4 Laboratory Reporting Limits

The laboratory achieved the RLs required by the approved SAP with the following exceptions:

- In early 2007, due to ongoing zinc contamination within ARI's metals laboratory, zinc reporting level for EPA Method 6010B was revised from 6 µg/L to 10 µg/L (0.6 mg/kg to 1 mg/kg for solids). The revised reporting limit is slightly higher than the approved quality assurance project plans. No action was taken.
- The reporting limits were not met in cases in which the samples were analyzed at dilutions due to high concentrations of target compounds or interferences. No action was taken.

7.5 Initial and Continuing Calibration Verification

All initial calibration, initial calibration verification (ICV) and CCV results for total and dissolved metals were within 10% of the initial calibration except as noted below. CCVs were performed every ten samples and at the end of an analytical sequence. Instrument precision criteria as specified in the SAP (Tables 5 and 6) were met with the following exception:

- SDGs QQ28 and QQ30: CCV2 for silver was out of control high and CCV4 for silver was out of control low. Samples were qualified as estimated (J/UJ) for this analyte.

7.6 Blank Contamination

The equipment, method, and continuing calibration blanks were free of target compounds with the following exceptions:

| SDG | Sample ID | Detected Analyte (Concentration) | Qualifier | Reason |
|------|--------------------|----------------------------------|-----------------------------------|--|
| PX33 | PL2SC-W-EB1-111209 | Zn (10 µg/L) | J+ for water n/a for solid | Elevated (estimated) result due to equipment blank contamination (SDG PX46). No qualification necessary since zinc concentration is ≥10x blank result (SDG QE75). |
| PY96 | PL2SC-W-EB3-112309 | Zn (10 µg/L) | n/a | No qualification necessary since zinc concentration is ≥10x blank result (SDG QI75). |
| QI75 | Method Blank | Cu and Zn ≥ RL | n/a | No qualification necessary since the associated sample contained Cu and Zn ≥10x the blank results. |
| QM43 | PL2SC-EB2-030310 | Zn (20 µg/L) | n/a | No qualification necessary since zinc was not detected in associated water sample (SDG QQ28) and associated filter bag sample (SDG QR17) contains Zn ≥10x blank result. |

7.7 Laboratory Control Sample Recovery – *acceptable*

Laboratory control samples were performed with each analytical batch. All LCS/LCSD recoveries were acceptable and within the QC limits of 80 to 120 percent. RPDs were also in control.

7.8 Matrix Spike Analysis – *acceptable*

Matrix spikes were performed on selected stormwater samples. LCS/LCSD data were used to assess accuracy in cases where matrix spike quality control was not performed (due to limited sample volume/mass in most cases, including all suspended solids samples) by ARI. Matrix spike percent recoveries were acceptable.

7.9 Duplicate Analysis – *acceptable*

Field duplicate data were used to assess precision on water samples associated with SDG PW88/PW89. Field duplicate analysis criteria were met. Laboratory duplicate analysis was performed on selected stormwater samples. LCS/LCSD data were used to assess accuracy in cases where laboratory duplicates were not performed (because precision analysis was unnecessary on SDGs where the sole sample was an equipment blank or limited sample volume made duplicate analysis impossible).

7.10 Interference Check Sample Analysis – *acceptable*

All interference check sample analysis results for total metals were within 20% of the true value, analyzed at the appropriate frequencies.

7.11 Linear Range Check Standard – *acceptable*

The linear range check standard analyzed for ICP analyses was within $\pm 10\%$.

7.12 ICP Serial Dilution Analysis – *acceptable*

All serial dilution results were less than 10% difference for analytes greater than 50 times the IDL.

7.13 Internal Standard Analysis

Internal standard recoveries for metals were not assessed because the data is not summarized by ARI (it is not achievable with current LIMS setup) and because this data is only available in the raw data package. If internal standard recovery is outside acceptance criteria the laboratory follows standard operating procedures consistent with the referenced method to identify and address the issue. Typical steps include flushing the instrument with a rinse blank followed by analyzing a calibration blank to assess internal standard responses. Once it is determined that instrument drift isn't occurring, the sample is reanalyzed at a dilution. Since associated quality control was within acceptance criteria, an assessment of internal standards is not necessary for a Level 1 review.

7.14 Field Duplicate Sample Analysis – *acceptable*

Field duplicate sample pair is as follows:

| Laboratory SDG | Sample | Field Duplicate Sample |
|----------------|------------------|------------------------|
| PW88 & PW89 | PL2SC-W-V-110809 | PL2SC-W-DUP-110909 |

Work plan goals for precision were met for dissolved metals. See further discussion above in Section 7.9.

8.0 DATA QUALIFIERS

Data qualifiers applied by the laboratory have been removed from the data summary report sheets and superseded by data validation qualifiers as follows:

The following qualifiers were used to modify the data quality and usefulness of individual analytical results.

- U – The constituent was analyzed for, but was not detected above the reported sample quantitation limit.
- J – The constituent was positively identified and detected; however, the concentration reported is an estimated value because the result is less than the quantitation limit or quality control criteria were not met.
- J+ – The constituent was positively identified and detected; however, the concentration reported is an estimated value because the result may be biased high.
- J- – The constituent was positively identified and detected; however, the concentration reported is an estimated value because the result may be biased low.
- UJ – The constituent was not detected; the associated quantitation limit is an estimated value because quality control criteria were not met.
- R – Data are rejected due to significant exceedance of quality control criteria. The analyte may or may not be present. Additional sampling and analysis may be required to determine the presence or absence of the constituent. For statistical reasons, rejected values are not included in the database.
- UR – The constituent is rejected at the reported quantitation limit.
- UY – The reporting limit is elevated due to interference. The result is not detected.

9.0 DATA ASSESSMENT

Data review and validation was performed by an experienced quality assurance chemist independent of the analytical laboratory and not directly involved in the project. This is to certify that I have examined the analytical data and based on the information provided to me by the laboratory, in my professional judgment, the data are acceptable for use except where indicated by data qualifiers, which may modify the usefulness of those individual values.



Kate McPeck
Environmental Scientist, GAI

May 13, 2010
Date



Kent Angelos
Principal Environmental Scientist, GAI

May 14, 2010
Date

10.0 REFERENCES

EPA 1999, USEPA Contract Laboratory Program, National Functional Guidelines for Organic Data Review, EPA-540/R-99/008, October, 1999.

EPA 2004, USEPA Contract Laboratory Program, National Functional Guidelines for Inorganic Data Review, EPA-540-R-04-004, October, 2004

Golder Associates Incorporated and Floyd|Snider, *Revised Stormwater Source Control Work Plan For Boeing Plant 2*, Seattle/Tukwila, Washington. Prepared by Golder Associates Incorporated and Floyd|Snider, December, 2007.